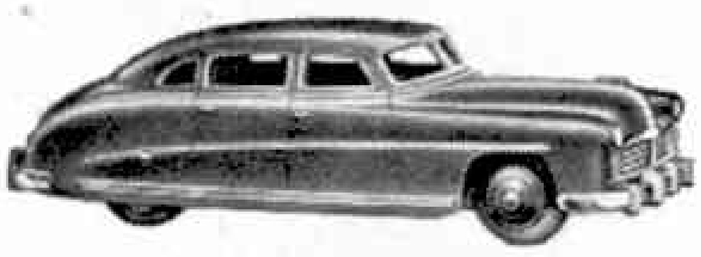
VOL. XXXVI No. 12 DECEMBER 1951

MECCANO MAGAZINE

A HAPPY CHRISTMAS

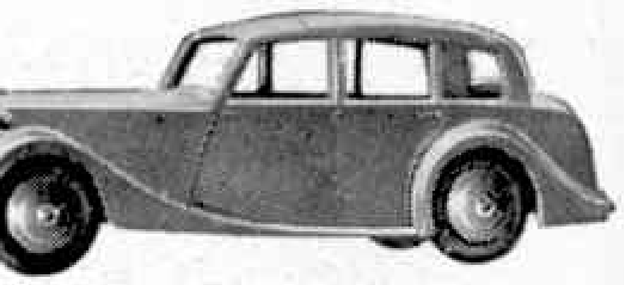
9D

DINKY TOYS



Hudson
"Commodore" Sedan
No. 139b

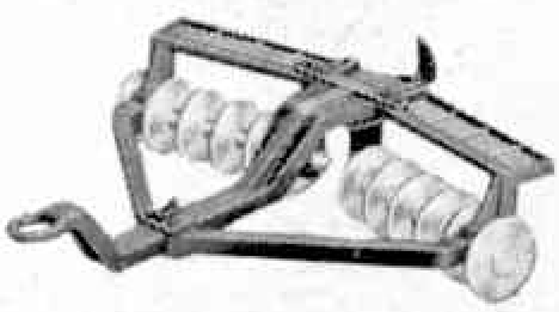
Land Rover
No. 27d



Triumph '1800' Saloon
No. 40b

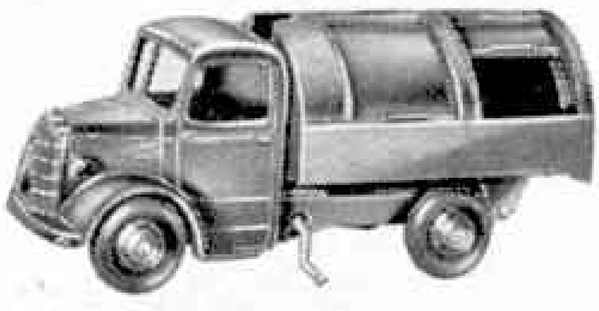
Massey-Harris Tractor
No. 27a

Harvest Trailer
No. 27b



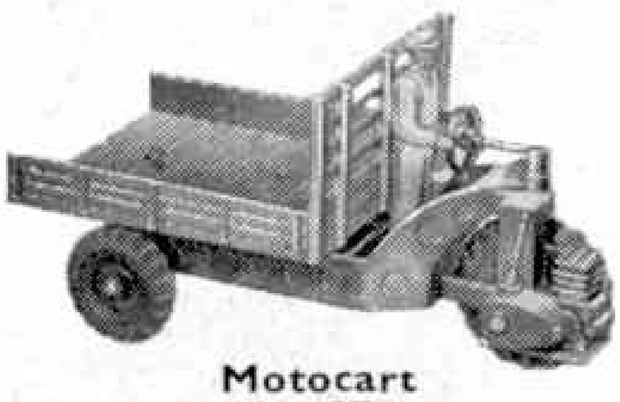
Disc-Harrow
No. 27h

Ford "Fordor" Sedan
No. 139a



Refuse Wagon
No. 25v

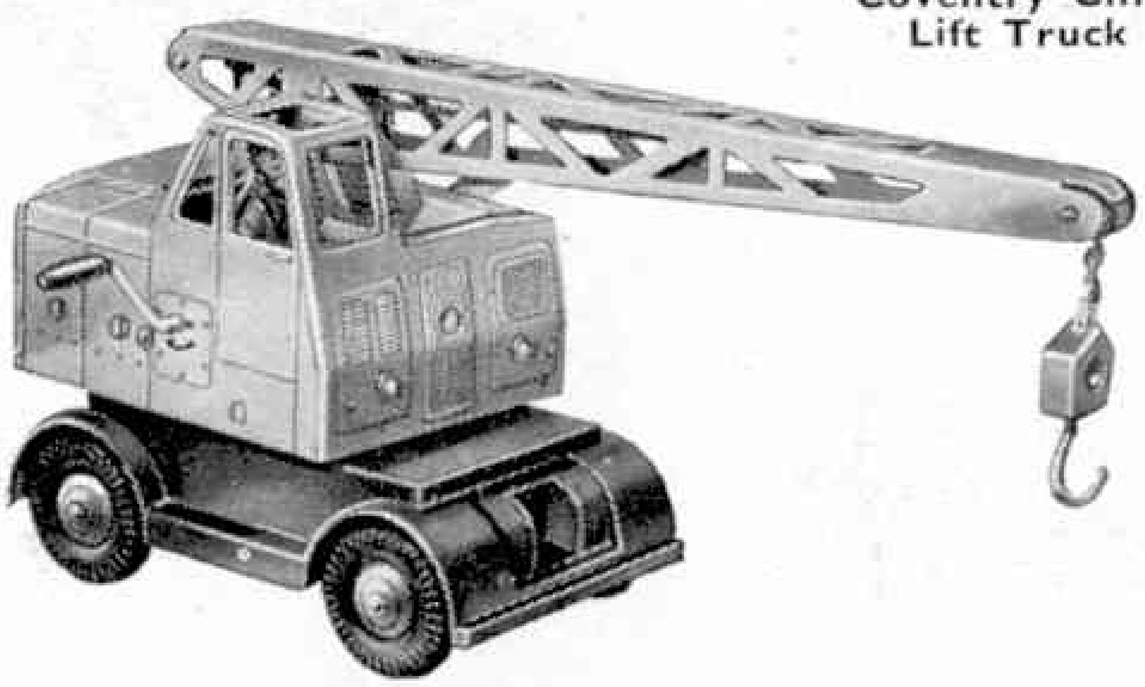
Rover 75 Saloon
No. 140b



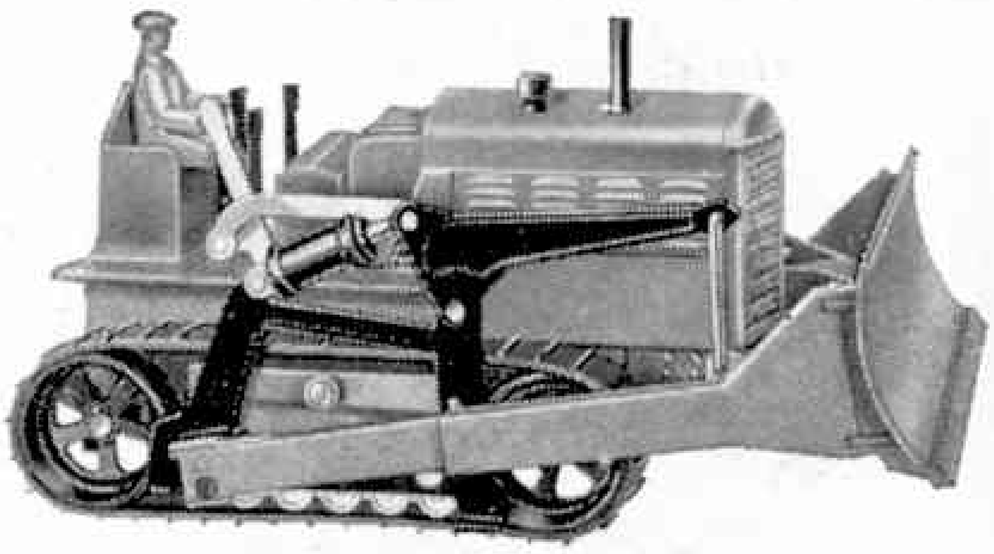
Motocart
No. 27g

Coventry Climax Fork
Lift Truck No.14c

Observation Coach
No. 29*i*



Coles Mobile Crane
No. 571



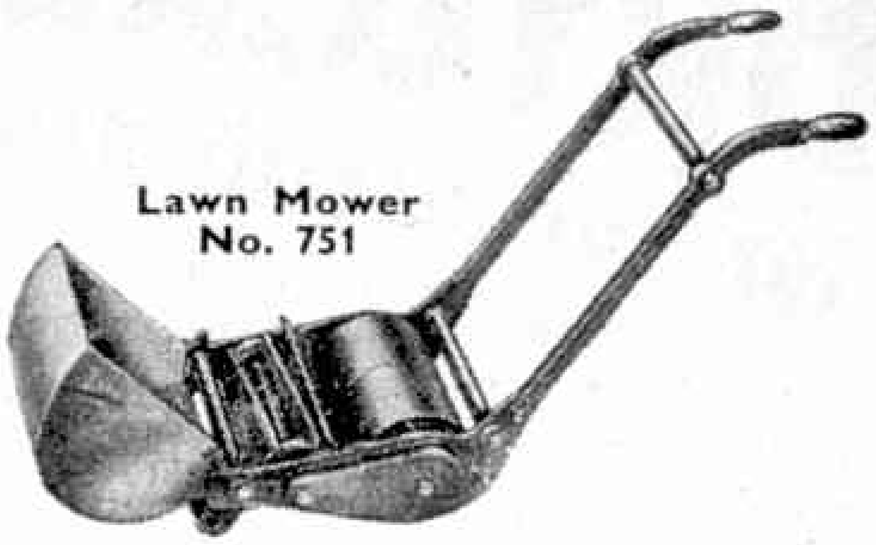
Blaw Knox Bulldozer
No. 561

Keep the wheels turning. Tyres for Dinky Toys can be obtained from your dealer

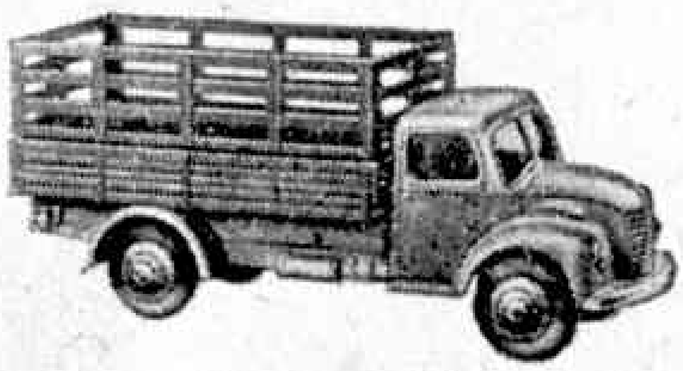
MADE IN ENGLAND BY MECCANO LIMITED

DINKY TOYS

Guy Van
No. 514



Lawn Mower
No. 751

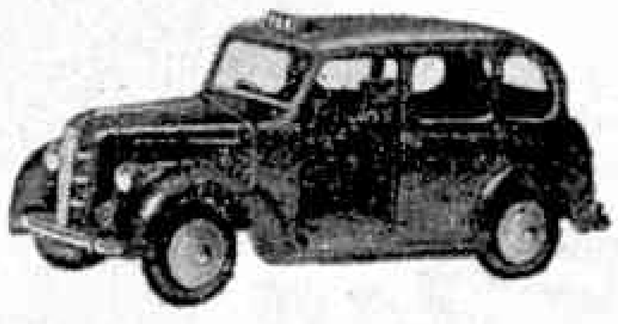


Farm Produce Wagon
No. 30n

Estate Car
No. 27f

Austin Covered Wagon
No. 30s

Morris Oxford Saloon
No. 40g

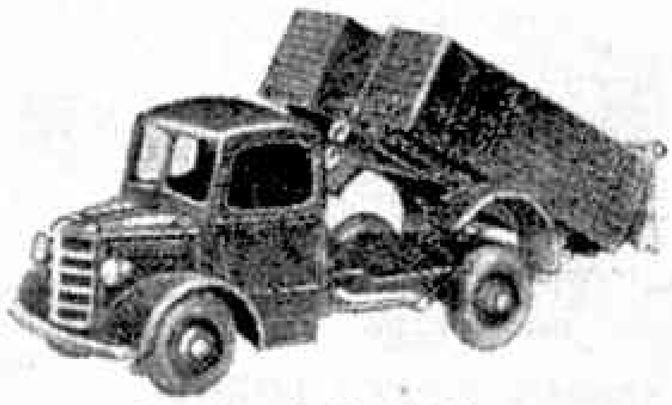


Austin Taxi
No. 40h

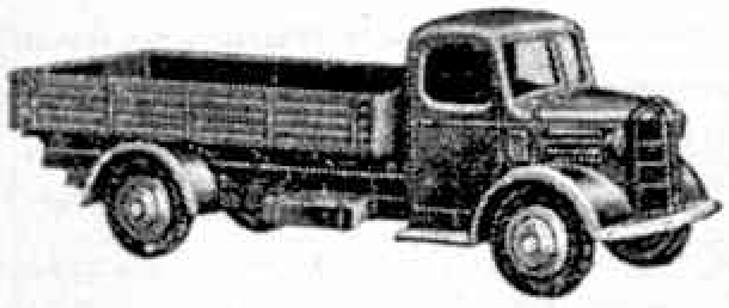
Breakdown Lorry
No. 25x

Daimler Ambulance
No. 30h

Bedford Truck
No. 25w

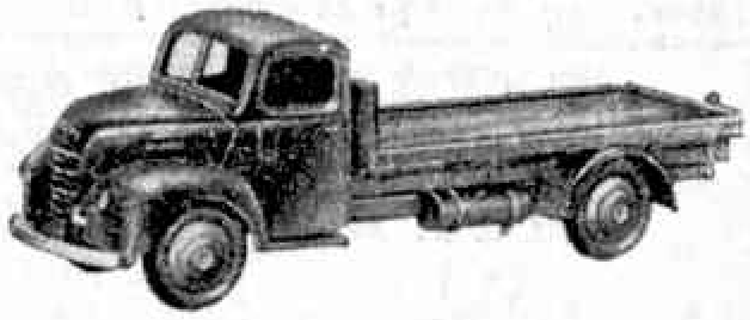


Bedford End Tipper
No. 25m



Austin Wagon
No. 30j

Austin "Devon" Saloon
No. 40d



Fordson "Thames" Flat Truck
No. 30r

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BRYLCREEM
for successful grooming

Successful men use Brylcreem because they know smartness pays—handsomely. Only Brylcreem keeps the hair perfectly groomed all day. Only Brylcreem gives that confident, disciplined smartness that is the hall-mark of success. And remember—your personal appearance demands the best, such as only Brylcreem can give. Ask for Brylcreem always—it's the perfect hair-dressing. Tubs 1/8, 2/6, and large economy size 4/6. Handy tubes 2/6.

BRYLCREEM
THE PERFECT HAIRDRESSING

ROYDS 72/38

THE Foden FLEET

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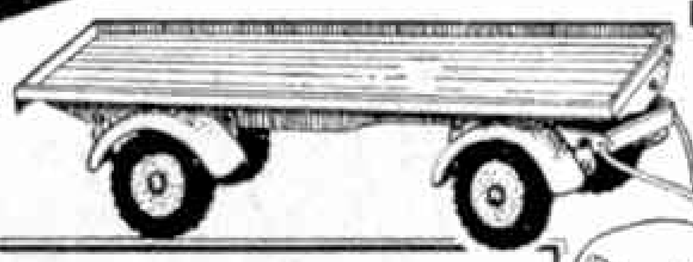
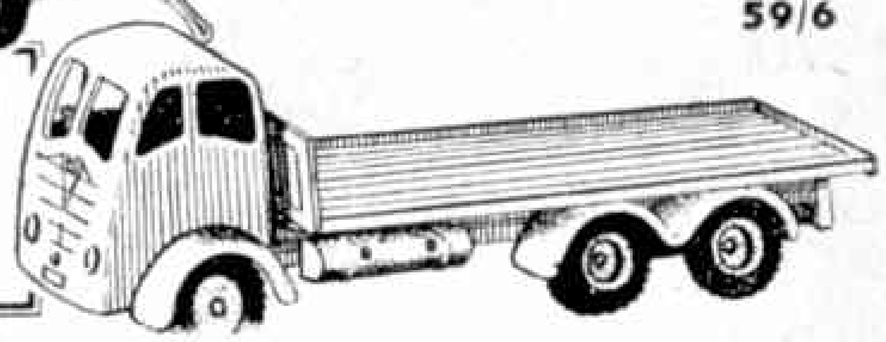


DYSON 8 TON TRAILER 18/6



FODEN F.G. LORRY 59/6

Built from standardised parts, all replaceable. They come to you ready assembled, easily dismantled. ASK YOUR DEALER!

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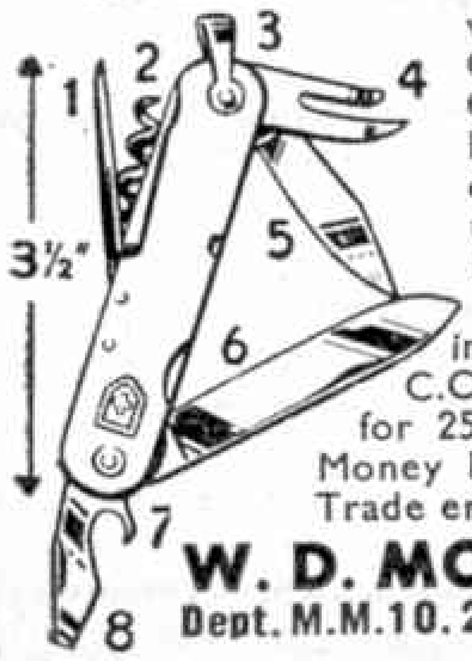
SENSATIONAL
OFFER OF A "SWISS" COMPANION KNIFE



with EIGHT attractions—Awl, Corkscrew, Safety Ring, Tin-Opener, 1½ in. Blade, 3 in. Blade, Bottle Opener, Screw-driver. Finest French make, razor-sharp, strong yet light and handy. Easily worth double.

Send 9/- for immed. delivery, C.O.D. 1/- extra. 3 for 25/-. 5 for 40/-. Money back guarantee. Trade enquiries invited.

8/6 POST etc. 6d

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ONLY 1/9

THE NEW WONDER ELEMENT
For ALL GAS LIGHTERS

Get this new and improved gas lighter element to-day! It will outlast all others. Works on 1.5 v. or 2.5 v. battery. Current consumption is negligible and dry-cells last up to ten times as long with JET-VITA—the new wonder element. **A six months written guarantee is given with each element.**

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JET-VITA

Sole Concessionaires:—
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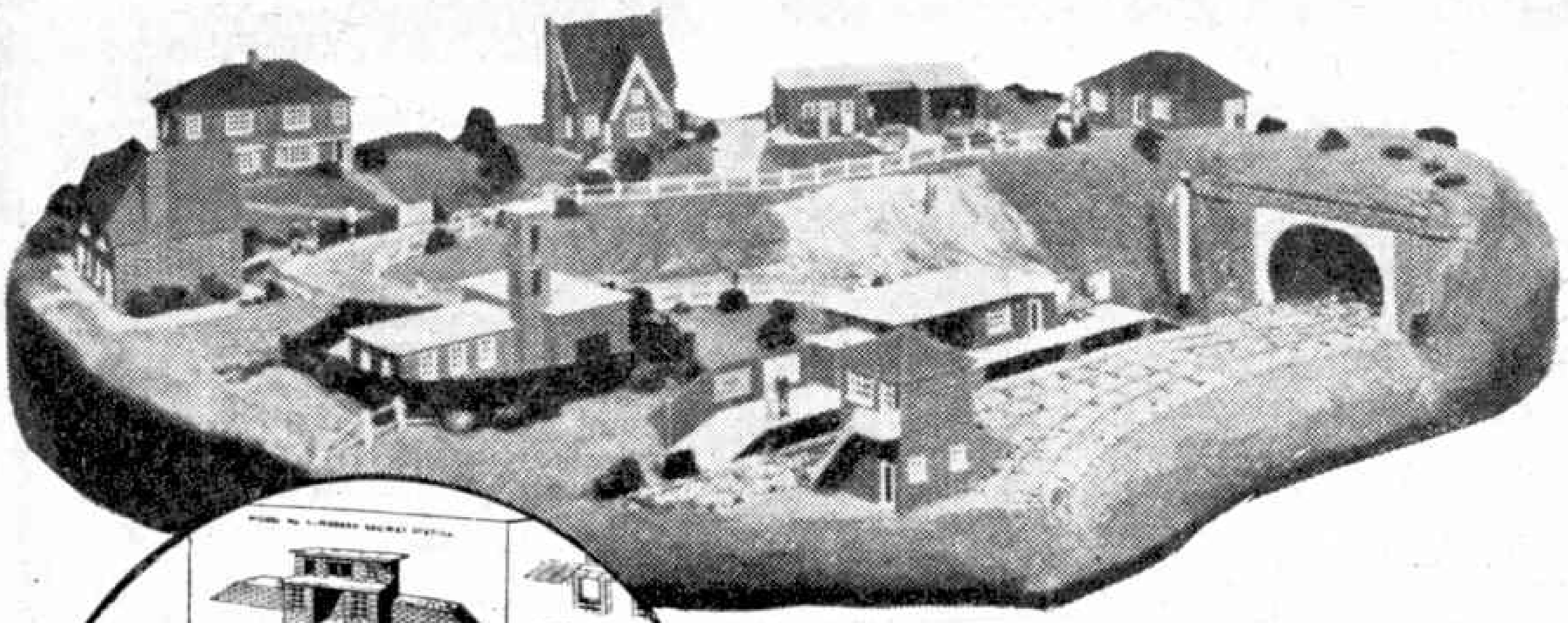
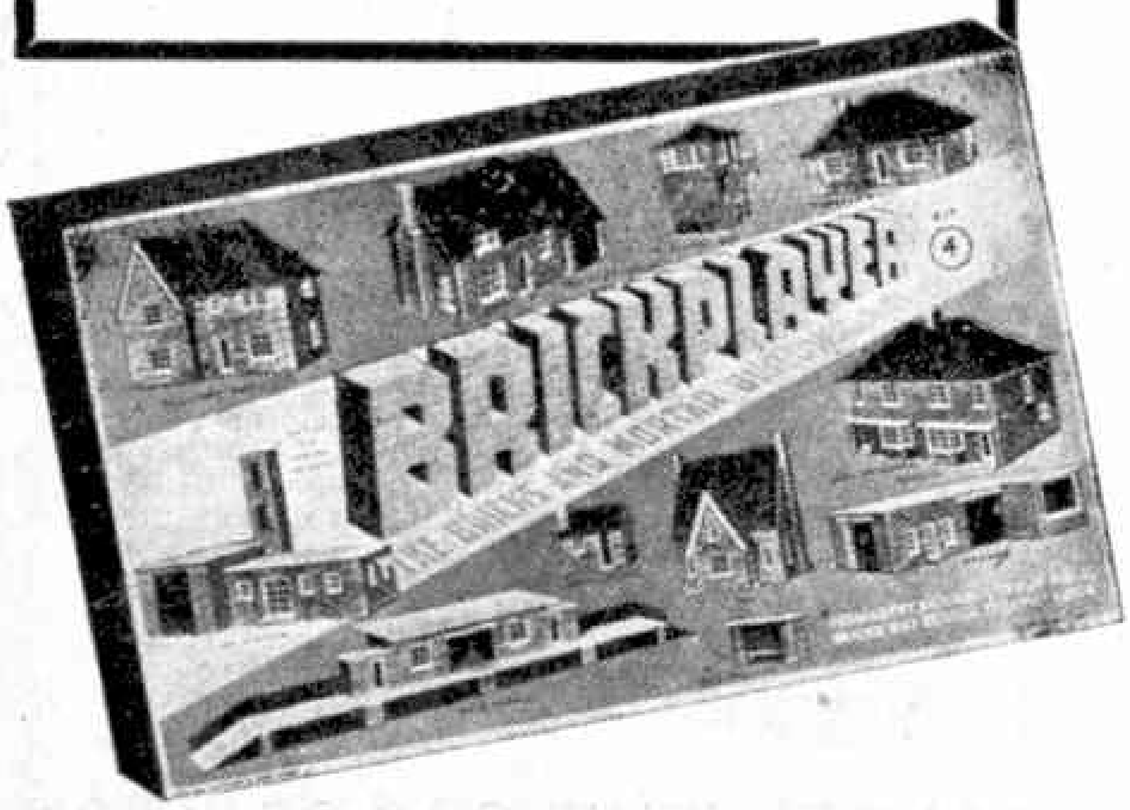


ENTER FOR THE BRICKPLAYER COMPETITION

Prizes of £10 10s., £5 5s., and £3 3s. and a number of consolation prizes of Brickplayer Accessories will be awarded for winning models.

Write for full details.



Build this Charming Model Village with

Brick and Mortar Building Kit and Accessories

The Brickplayer Kit contains miniature bricks in all required shapes, mortar, roofing, metal windows and doors, plans and instruction booklet. All models are architect designed to "0" gauge scale. Buildings can be permanent or dismantled by merely soaking in water, and the bricks used again and again.

Brickplayer Kits at 28/6 and 52/6 and Accessories are available from good toyshops and stores.

If your dealer cannot supply, write for address of nearest stockist to:

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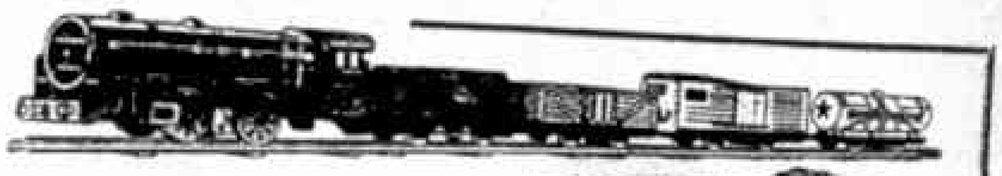
Dept. "M" • Enfield • Middlesex

YOUR IDEAL CHRISTMAS GIFT

GAMAGES

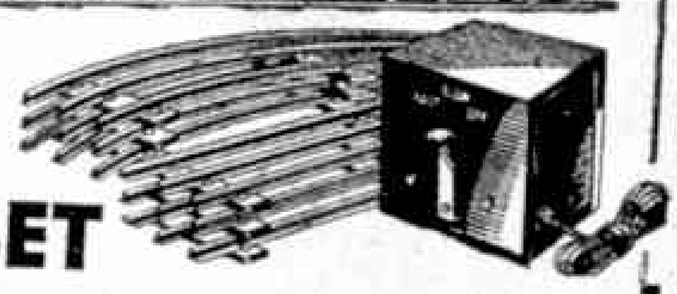


'Mastrand' STEAM ROLLER

Beautifully finished "live steam" working model with die-cast polished aluminium wheels, rollers, etc. Chromium cylinder. Partly enamelled red and green.
Length 7 in. *Post & Pkg. 1/3* **54/-**

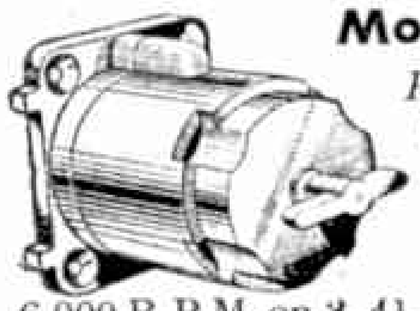
Christmas Toy List Free

'O' Gauge Electric TRAIN SET



Produced exclusively for Gamages by a famous Anglo-American manufacturer. Comprises: Locomotive with powerful 12v. A/C reversing mechanism, tender, open truck, petrol wagon and goods van with sliding doors. Eight curves and four straights in good quality 3-rail track make-up the oval layout. A robust Transformer/Controller gives full speed and reversing control. 230-250 volt input. 7-12 volt A/C output. Complete with standard Transformer. *Post and Pkg. 3/-* **£5/17/6**
Set, without Transformer, **£4/7/6**. Standard Transformer, **30/-**; Super Transformer, **45/-**
Spares: Straights and Curves, **2/6**; X-overs, **15/-**; Hand-controlled Points, **20/-** each; Electrically-controlled Points, pair, **5** gns.

Frog "TORNADO" Motor

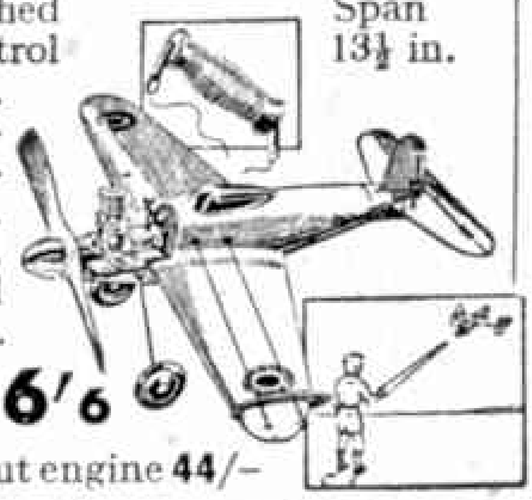


Post 4d.

6,000 R.P.M. on 3-4½ volt D.C. consumption. ·125 amp. A new miniature electric motor for model cars, trains, etc. Weight 3 oz. **7/6**

"CHALLENGER"

The only finished ready-to-fly control line trainer. Practically unbreakable construction. E.D. Bee 1 c.c. diesel. With control handle and lines. Span 13½ in.



Complete with engine **96/6**
Post free. Without engine **44/-**

Gamages BOXES OF TRICKS

Famous compendium of conjuring tricks complete with full directions.
Box No. 2 (as shown) **21/-** *Post 1/-*
Box No. 1 **12/6** (Smaller version)

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There is only one 'Plasticine'—made solely by Harbutt's Plasticine Ltd. You will find 'Plasticine' invaluable for adding the touch of realism to your models. For prototypes, 'mock ups' and other uses there is no more practical medium than

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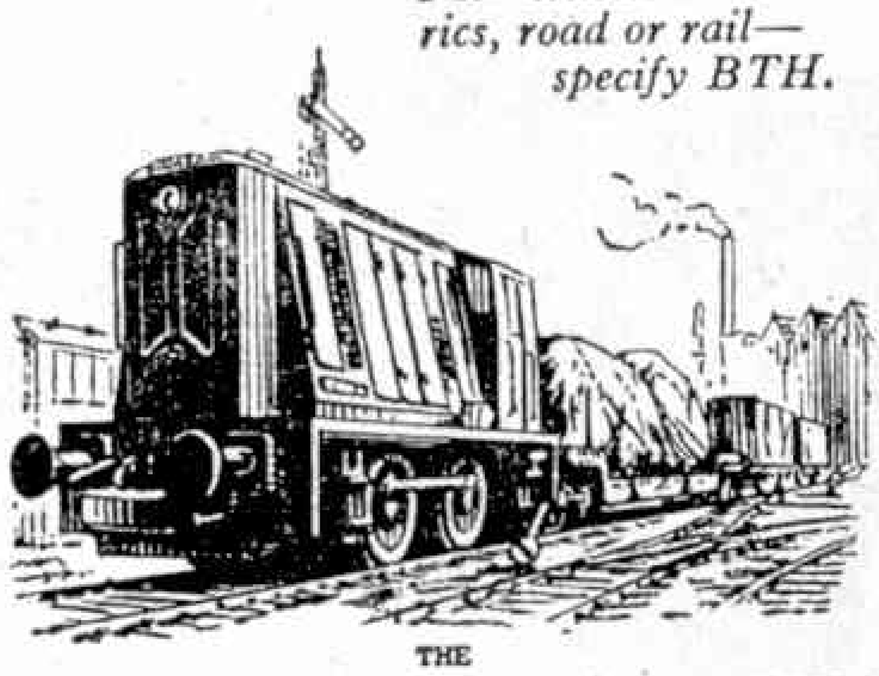

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BRITISH THOMSON-HOUSTON
COMPANY LIMITED, RUGBY, ENGLAND. A4283

Get ready to make this a real Western Christmas!

Look like a real cowboy in one of these smashing 'Merit' outfits! Tailor-cut and made to ensure perfect fit

'MERIT' COWBOY OUTFIT No. 18

Complete with western-style Suedeen-faced bolero, fringed and edged, with attractive leaf pattern in contrasting colours, and heavily studded with brass-finished dome-headed studs. Decorated chaps, gingham shirt with contrasting binding, and new artificial silk kerchief with jewelled and studded toggle. Good quality felt stetson hat and lariat. Size 5-6 years, **73/11** inc. tax; 7-8 years, **75/11**; 9-10 years, **77/11**. Packed in stout box.

'MERIT' COWBOY OUTFIT No. 14

Complete with cotton shirt with stylish fringed yoke and cuffs in contrasting colours. Authentic western style Suedeen faced chaps, edged and with attractive leaf motif in contrasting colour. Artificial silk kerchief and jewelled and studded toggle. Complete with lariat and felt stetson hat. Size 5-6 years, **68**/– inc. tax.; 7-8 years, **70**/–; 9-10 years, **72**/–. Packed in stout box.

See all 'Merit' and S.E.L. products at good dealers or send p'card for illustrated list to

J. & L. RANDALL LTD

(Associated Company: SIGNALLING EQUIPMENT LTD.)

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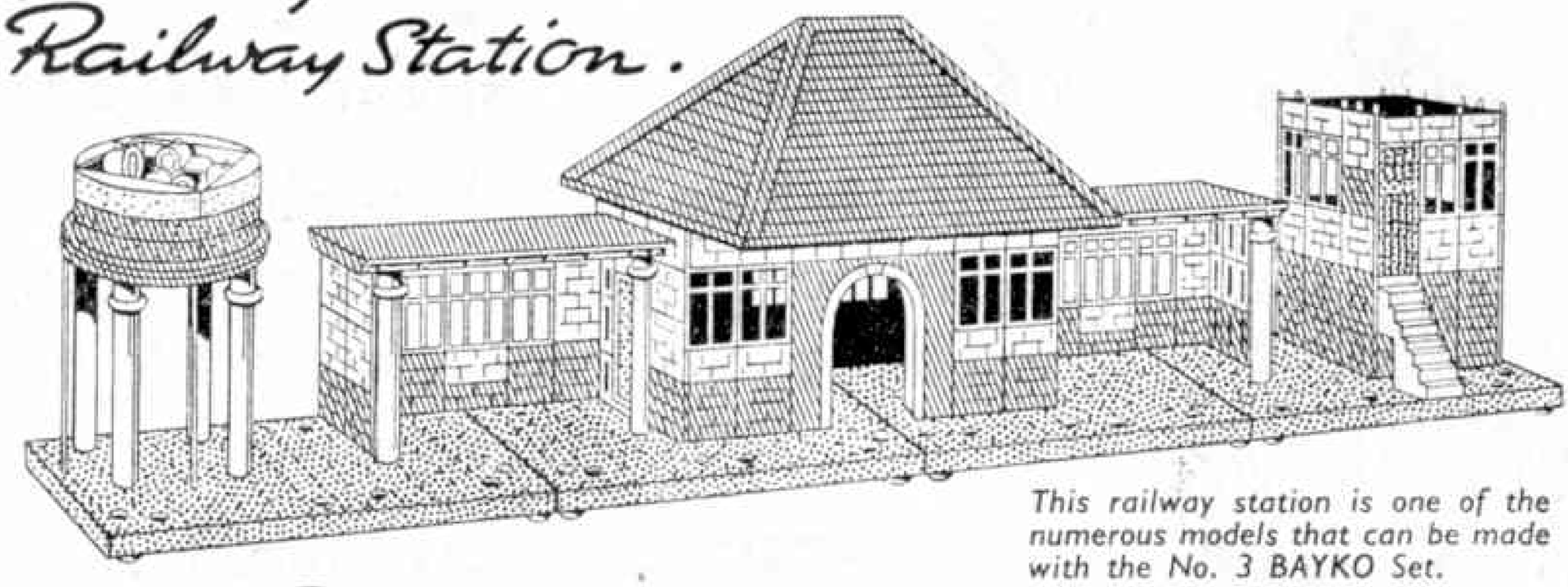
Build your own-
Railway Station.



This railway station is one of the numerous models that can be made with the No. 3 BAYKO Set.

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REGISTERED TRADE MARK
the Original Plastic
BUILDING SETS

Made from richly coloured, high-grade plastic material, BAYKO is beautifully finished, easily cleaned and will survive years of hard treatment.

PRICES:

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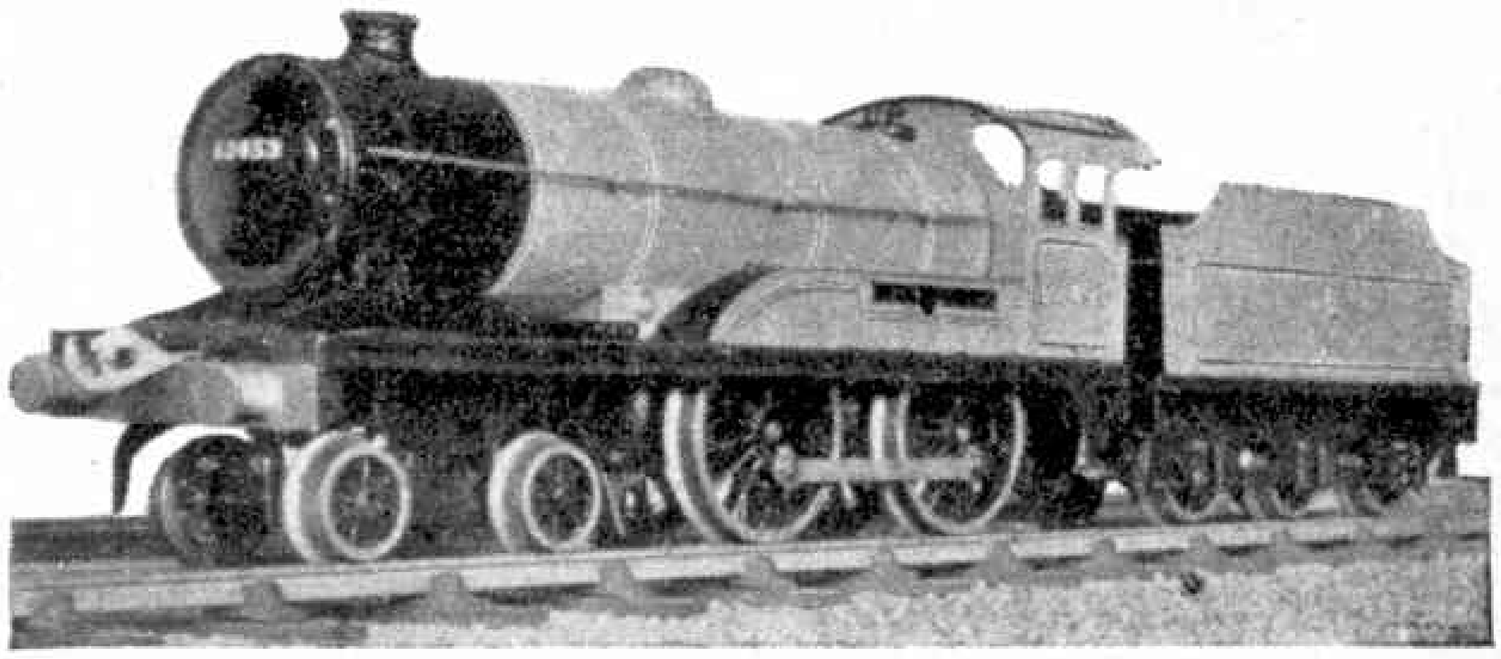
No. 3	59/-	No. 3x	60/-

PLIMPTON ENGINEERING Co. Ltd.
GIBRALTAR ROW, LIVERPOOL 3

You'll be glad you chose 'THE REAL THING'



A Bassett-Lowke railway is as true to reality as the world's greatest model engineers can make it. Apart from the fun (and there's no end to that!) you will want a railway you can take seriously—can add to and extend, making it ever more complete, more complex, more lifelike. So be sure to begin right—with a Bassett-Lowke "Prince Charles" Train Set.

Complete sets including P.T. Clockwork £7/17/6d. Electric £20/12/6d.

FREE on request — beautifully illustrated brochure of "Prince Charles" train sets and accessories.

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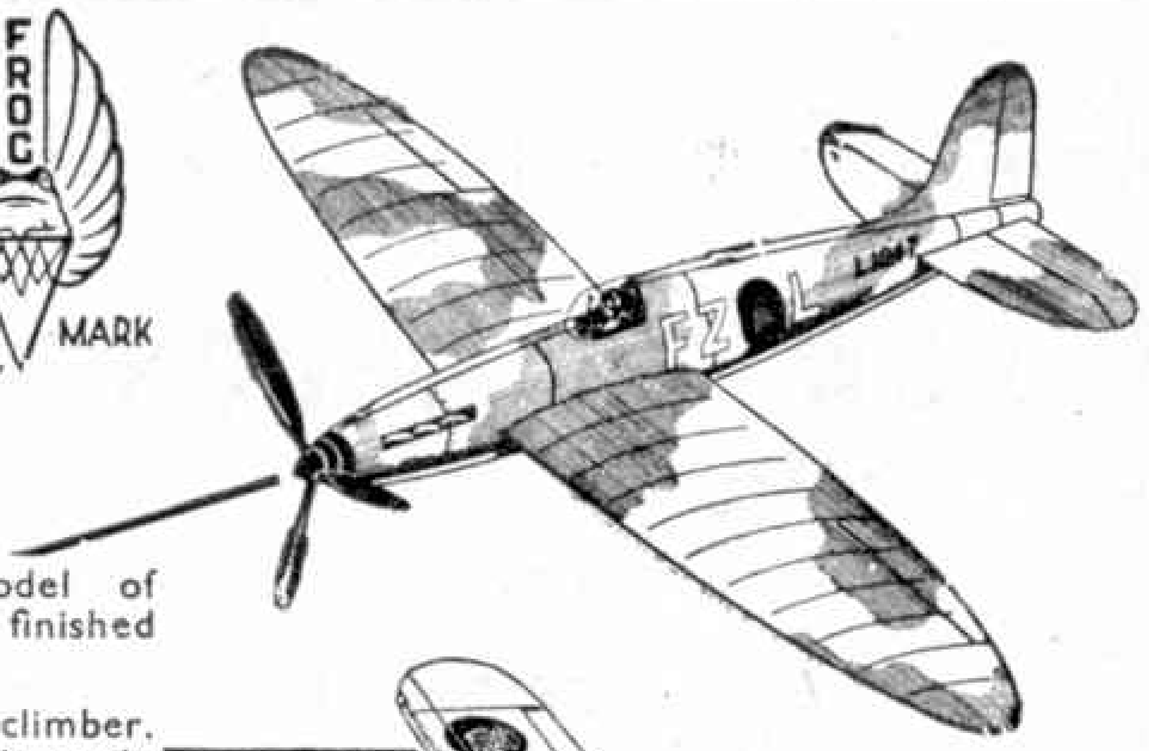
The "Prince Charles" sets are in the ever popular Gauge 'O' scale and details of the magnificent range of locos., coaches, goods wagons signals, and a host of accessories are to be found in our 40-page illustrated Gauge 'O' Model Railway Catalogue Ref.: GO/17, which will gladly be sent ..... Price 1/-

FROG

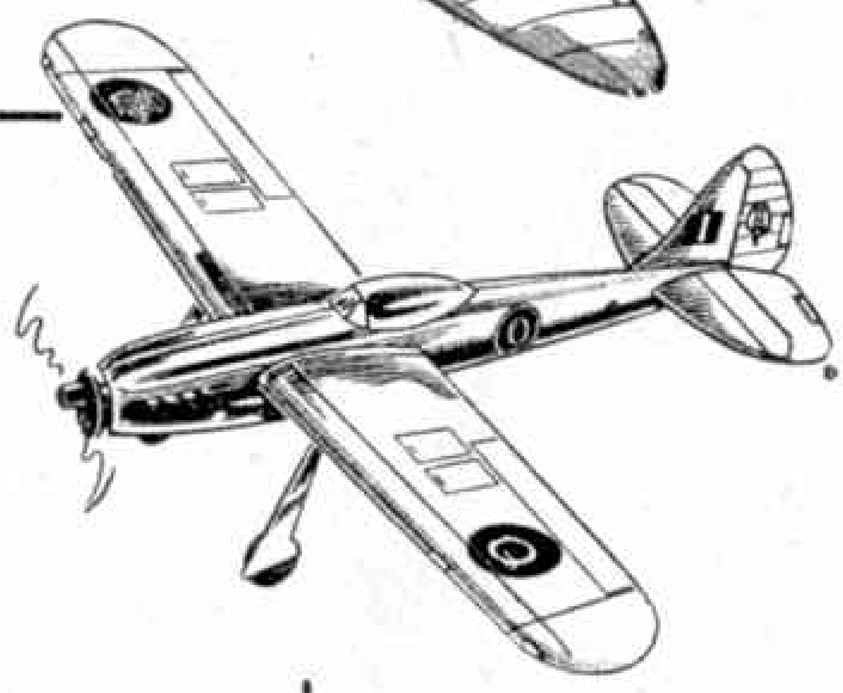
TRADE MARK

READY - TO - FLY MODELS



"SPITFIRE"—A splendid near-scale model of the famous fighter. Rubber powered and finished in camouflage colours. Span 17 in.

MK. V. FIGHTER—A fast and terrific climber. This famous model is rubber powered and is ready packed in a special high speed winder box. Span 12 in.

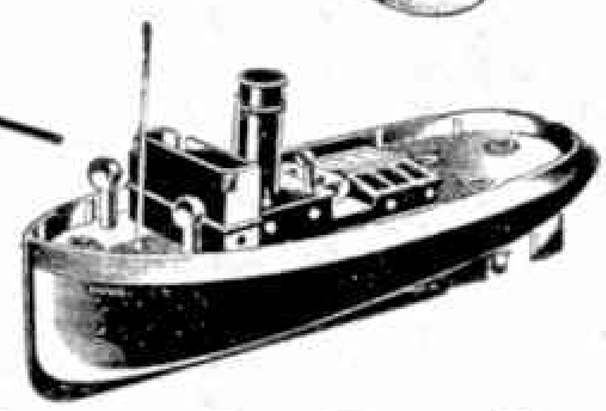


PENGUIN

TRADE MARK

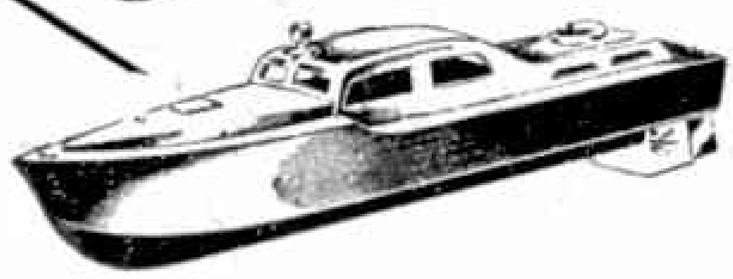
CLOCKWORK SCALE MODEL BOATS

TUGBOAT "ANNIE"—A Thames tug in miniature with accurately detailed deck fittings, detachable mast and folding funnel. Powered by a strong clockwork motor. Length 7½ in.



9 in. **"SOLENT" CRUISER**—A fine model with contrasting colours for hull and deck, and windows in cabin. Fitted with a powerful motor and 3-blade screw.

11 in. **CABIN CRUISER**—A fast, clockwork-powered cruiser with beautifully detailed hull and deck. Complete with dinghy, pennants, navigation lights, etc.



We do not supply direct—so ask your local dealer for full details and prices.

To.....

With best wishes for a Happy Xmas

Wouldn't it be fine

if one of these models had your name on it!

INTERNATIONAL MODEL AIRCRAFT LTD. Merton, London S.W.19, England

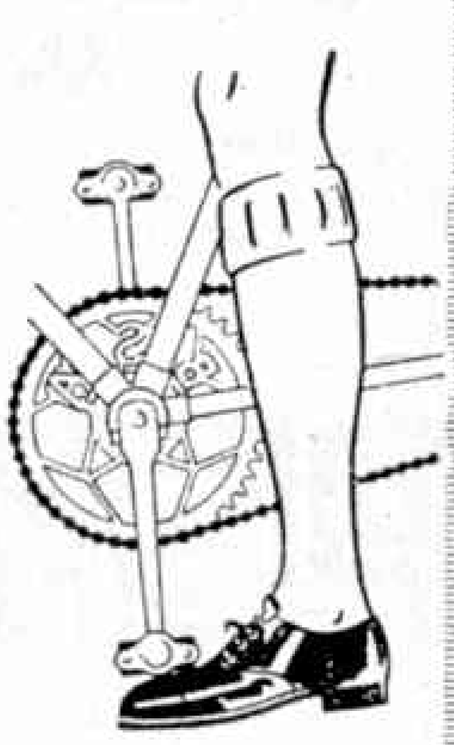
LINES BROS GROUP

HOW TO CHOOSE YOUR BSA

Here's one important test

GET THE RIGHT SADDLE HEIGHT

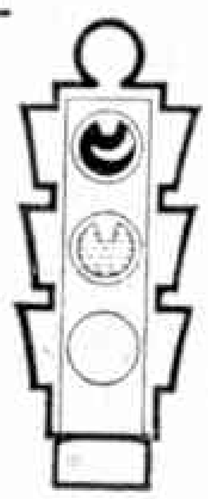
SIT ON THE SADDLE with your leg straight, and the pedal down as far as it will go. You should be able to place your toe comfortably *underneath* the pedal. Adjust saddle height to give you this position.



BSA

JUNIOR ROADSTER

SAFETY MODEL



Note the "SAFETY MODEL" transfer on the seat tube! Light but sturdily built 18 in. frame. Black and chromium finish. Wheels 24 in. Dunlop tyres. Chromium-plated, upturned handlebar. Roller lever brakes. Price £10.10.0 plus £2.9.0 Tax. (Colour finish extra—boy's Windsor Red, girl's Green.)

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MECCANO MAGAZINE

Editorial Office:
Binns Road
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Vol. XXXVI
No. 12
December 1951

With the Editor

Christmas Cheer

Once again the time has come for me to wish every reader of the "*M.M.*" a Merry Christmas. It is always a delight to me to be able to send these good wishes to the many thousands of Magazine enthusiasts in all parts of the world, and to receive similar greetings from so many of them, and the thrill and pleasure increases as the years go by, for every Christmas season brings with it a host of new friends.

Christmas is a world-wide festival, and this is one reason why it is so closely associated in our minds with Meccano and Hornby Trains. Another is that it was at Christmas that most enthusiasts first became owners of Meccano Outfits or of Hornby or Hornby-Dublo Train Sets, and ever since they have remembered well the particular Christmas season that saw their entry into the world of delights these hobbies bring. I am sure that all who become enthusiasts this Christmas will enjoy their new possessions just as much as the older ones have done, and I hope that every Meccano boy, young or old, will have a really jolly time.

I need not exhort old readers to write to me. They do so already. Countless letters reaching me from all the corners of the Earth make a fine start to every day in the Editorial office, but there is always room for more and I want every new reader to join the older ones in this friendly correspondence, even if they only want to tell me what a fine Christmas they enjoyed.

Good Things to Come

A word now about the "*M.M.*" in 1952. The January issue will give us a good start with an article on snow houses in the Arctic, telling readers how to build these snow wonders—if of course their winters provide them with enough of this astonishing building material. The largest bus terminal ever built is the subject of another fine contribution. For animal lovers there is a circus article telling interesting stories of elephants and chimpanzees, and there will be good railway and aircraft contributions.

A feature that model-builders will greet with enthusiasm will be the first of a series of competitions based on the different Meccano Outfits. As the great Christmas Contest announced in this issue is open until the end of March, there will be splendid opportunities for all model-builders, old and young, to win fine prizes. Hornby and Hornby-Dublo owners too will find that their needs are being met in the January issue and those that follow it, and I have plans for making the Magazine more and more useful to them.

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Christmas Crackers in the Making

By Arthur Nettleton

FOR just over 100 years the Christmas cracker has been a popular feature of our Yuletide festivities, and to-day about 40,000,000 of these "bon-bons," as they were originally called, are sold every year. Yet their production is still largely a handicraft.

Machines have been introduced to perform some of the processes in recent years, but nimble fingers still carry out several of the manufacturing operations. Manual dexterity is still largely responsible for their creation, particularly in the case of large and elaborate Christmas crackers.

To-day cracker making is a large industry, and one factory alone nowadays turns out more than 100,000 crackers a month. It is an all-the-year-round activity, too, for no sooner is one Christmas over than catering for the next is begun. That means inventing new types, efforts being made to give each season's output a certain topicality. This is done by introducing up-to-date novelties, such as the miniature flags of the Allies which were to be found in some of the limited number of crackers produced during the war; or a ticket purporting to entitle the holder to a seat in the first rocket plane to visit the Moon!

In all, some 70 different materials and articles go into the making of a single boxful of crackers. These include the semi-stiff white paper lining of each cracker, the crepe coverings, the mottoes, the paper caps, the friction strip that makes the bang, the lucky charms, and the picture on the lid of the box.

Paper of various kinds is of course the main material used by cracker manufacturers, crepe being the variety most needed. But paper-backed foils and coloured transparent film are also required. Nor is production haphazard, or the choice of materials left to the individual worker. Everything is done in accordance with a pre-conceived plan, artists preparing colour schemes that will harmonise, and other experts deciding just what shall be put into each cracker, how the contents of the boxes shall be packed, and what form the picture on the lid shall take.

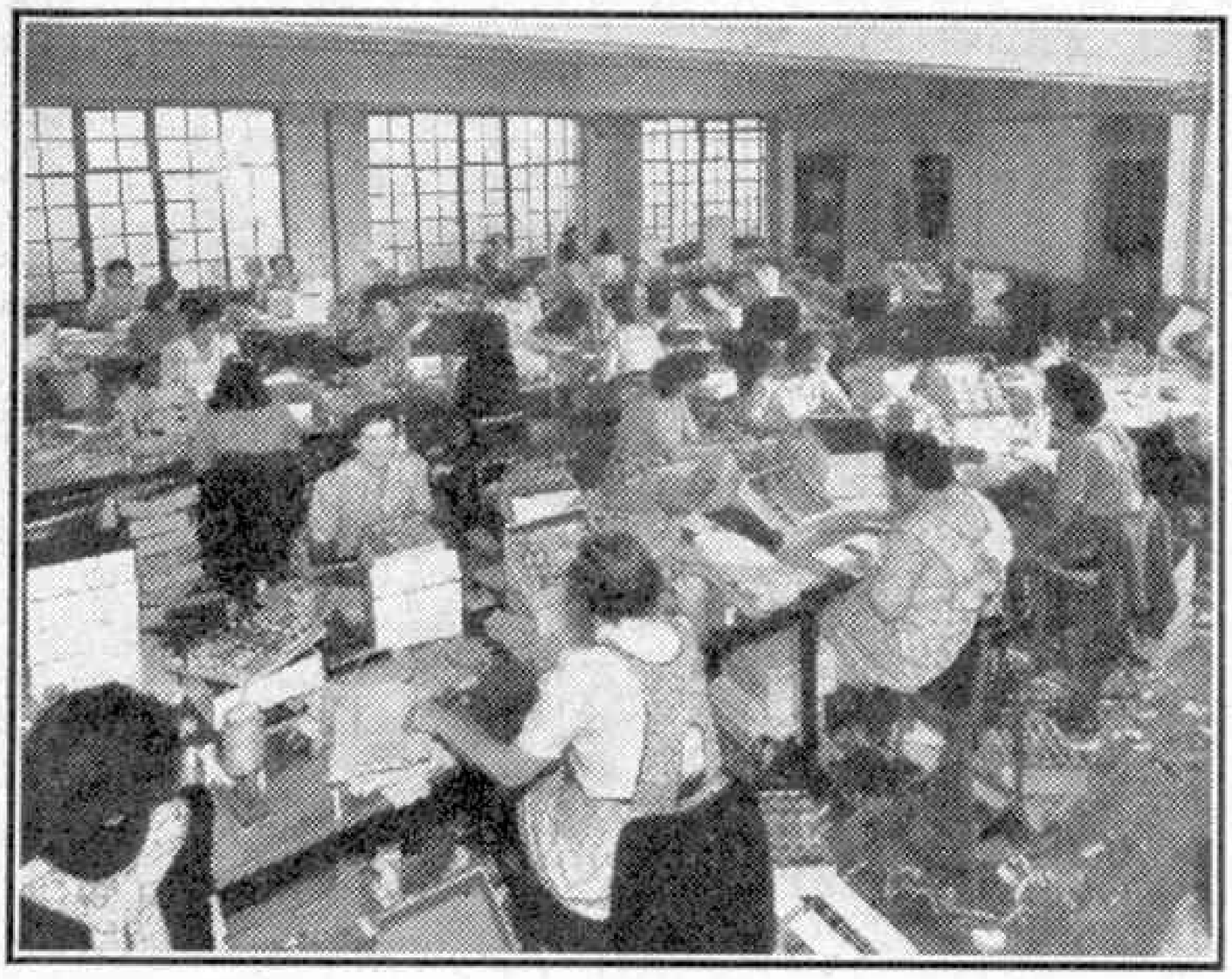
The first stage in the actual production is to cut the flat strips of paper to the correct size on a guillotine, and for many designs this step is followed by passing the paper through machines which cut a fringe or fancy edge.

The next part of the job is to build up the cracker, first by laying the component papers on a guide and fastening them together with a narrow strip of gum. At this stage the strips may be as long as 36 in., but they are now cut to the correct length before being passed to the craft workers who transform them at an astonishing speed into the familiar cylindrical cracker form.

Crackers are formed round a metal cylinder, which is in two portions, and this illustration shows the second part of a cylinder being removed during the making of a cracker.

This is a skilled craft which takes about 18 months to master. The only "tools" used are two cylinders of metal, which when placed end to end are slightly longer than the finished cracker. Before wrapping the paper "flats" round these, the worker places on them the explosive "snap" and the motto. After being wound round one end of the metal former, one end of the cracker is tied with linen thread and one half of the cylinder can then be removed.

Before the other end is tied, the novelties and other fillings not already introduced



The general scene in a cracker factory, with production in full swing for the Christmas season.

are placed inside the cracker and the second half of the metal cylinder is partly withdrawn. The final tie-band is made at the cracker end of the cylinder, so that the latter may then be removed completely.

Nearly all crackers undergo a subsequent decorating process, this again being performed by hand. A coloured "scrap" picture is added, silver or gold "spangle" is used effectively, and a quantity of imitation snow may be sprinkled on the article.

Boxing the crackers is another job for which machinery is less satisfactory than the hands of girls, for it is important that the contents of the boxes be so arranged that they will not become crushed. Even more highly skilled is the craft of trimming large table crackers which are to be used as decorative pieces at Christmas parties. Beautiful floral effects and novelty mounts are often created.

Indeed, to-day perhaps greater emphasis is placed on the decorations of crackers than upon novelty—though an up-to-date touch is still sought. A series of crackers containing midget copies of popular newspapers and magazines was once put on the market. Another year full-sized paper uniforms enabling the recipients to dress up as John Bull, Britannia, or Uncle Sam were put inside some of the more expensive Christmas crackers.

The first crackers, which appeared as "bon-bons" in 1847, were actually sugared almonds wrapped in paper, and their only similarity to our present-day Christmas crackers was their shape. These "bon-bons" are believed to have been invented in France, but it was an enterprising London master-baker who developed the idea into a Christmas novelty and made it a popular feature of our Yuletide festivities.

Foreseeing that the confections must be given some further attraction if their popularity was not to decline with the arrival of further Christmases, in 1848 he included a little printed motto inside the wrapping of each sweet. Two years later came the first bon-bons with a lucky charm, toy, or puzzle inside.

Not until 1860 was the Christmas cracker really a *cracker*, which exploded when the two ends were pulled sharply. This novel notion arose from a happy chance—followed by painstaking experiments lasting two years. The idea of making the bon-bons bang occurred to the same London genius when he noticed that the logs on the Yule fire crackled as they caught alight.

The inventor envisaged his bon-bons as logs, and imagined them giving sharp little explosions in the same way. Various

A corner of a cracker works, where materials for final assembly are being prepared.

methods of creating this effect were tried—all to be abandoned for one reason or another. The explosion had to be free from the risk of fire and non-injurious to the persons pulling the cracker.

The problem was eventually solved by means of a friction strip containing a small quantity of saltpetre, the method still in use. Even then the bon-bons did not at first become known as crackers. They were at first called "Bangs of expectation," but the public soon gave them the name applied to them to-day.

Few ideas to assist Christmas merrymaking have had such a wide appeal. The Christmas cracker is now known all over the world, and there is a big export trade in such seasonable novelties. The demand for them is so great that some firms employ workers to produce crackers in their own homes.

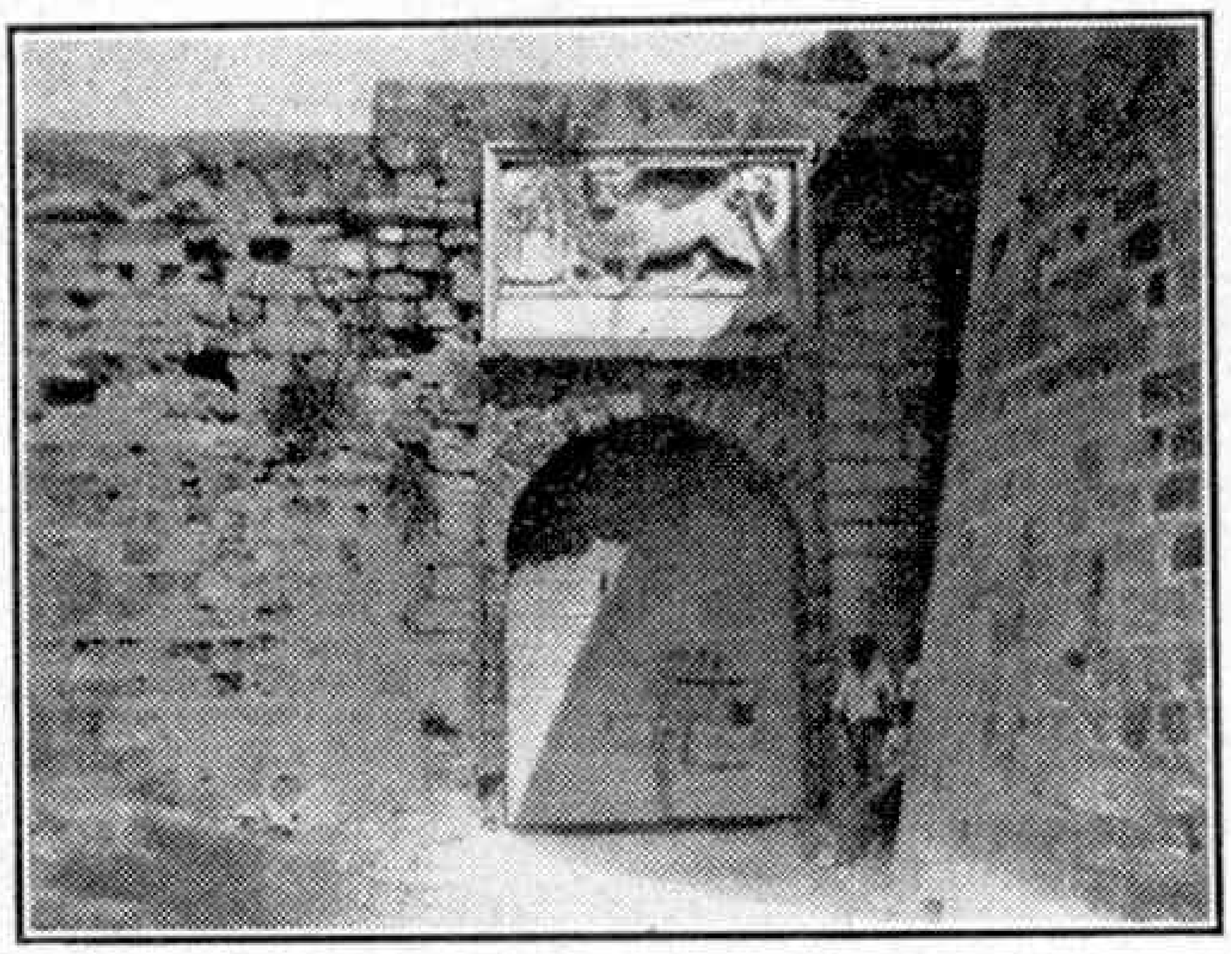
It may ultimately become possible to mechanise the work to a somewhat greater extent, but there is yet no sign that this hundred-year-old trade will be completely turned over to machines.

In addition to beautiful handmade crackers of the usual sizes, some exceptionally big ones are sometimes made to meet special orders. An American millionaire once treated his Christmas guests to a monster Christmas cracker which, when pulled by two servants dressed as Father and Mother Christmas, showered smaller ones about the room. There was one for each guest, and when these smaller crackers were pulled they were found to contain valuable gifts to the total value of more than 5,000 dollars!

Crackers for export being packed in their gaily coloured boxes.

Othello's Tower

To anyone as interested in architecture and archæology as I am there is plenty to see in Cyprus, which abounds in Roman remains, ruined castles and mediæval churches. The remains of Saint Hilarion Castle, which is built on the top of a lofty peak, are very interesting. There are three lines of defence in all, each with different buildings, such as lookout towers, halls and kitchens. Bellapairs Abbey nearby is the best example of Gothic architecture in the Levant.



The Lion Gate, Othello's Tower, at Famagusta in Cyprus. Photograph by D. J. L. Harding, Repton.

Near Famagusta, which is on the East coast, I explored the remains of the old town, with its marvellous cathedral of Saint Nicholas. The old walls of Famagusta are very impressive and are of a great thickness. By the sea stands Othello's Tower, where the tragedy made famous by Shakespeare's tragedy, is supposed to have taken place. As there are long and gloomy passages inside this building, which was really the citadel, I can well imagine the plot taking place inside its walls. Over the entrance can be seen the famous winged Lion of Venice, placed there by the Venetians, who fortified the city about 1570.

D. J. L. HARDING (Repton).

"Elettra II"

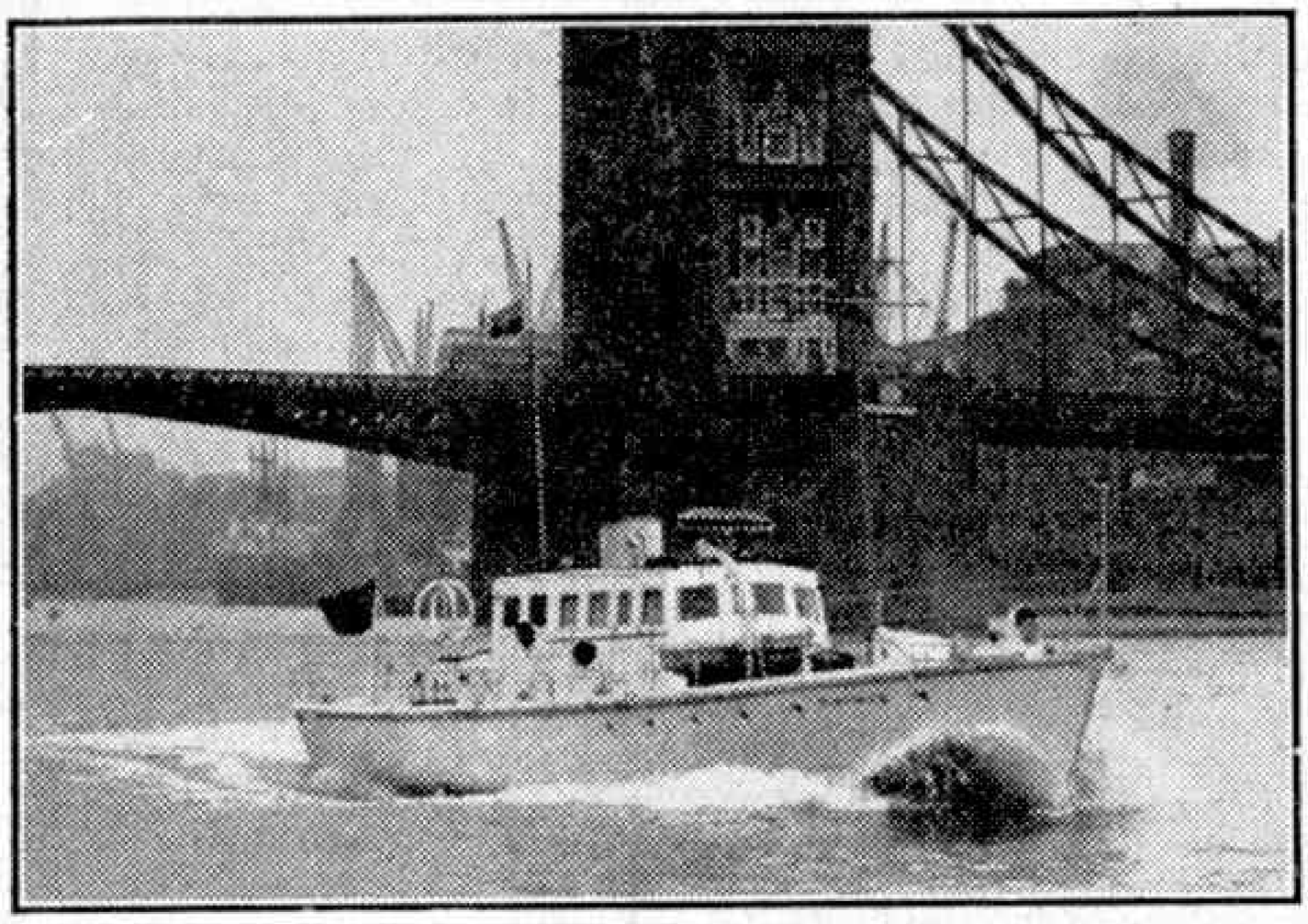
The New Marconi Marine Research Yacht

AMONG the earliest triumphs of radio the most spectacular were the rescues at sea that the new means of communication made possible. In view of the importance of radio communication for these and other marine purposes of the highest importance it seems fitting to recall that Marconi, the great inventor who developed it, was devoted to the sea. In his yacht the *"Elettra,"* which he bought soon after the end of the first World War, he made many voyages, but his chief purpose in acquiring her was to use her as a floating laboratory in which to test equipment and work out new methods. In particular the yacht was largely used in the experiments that led to the development of radio telephony, which to-day enables passengers at sea to speak to their homes and offices, often many thousand miles away, and of the Marconi short wave beam system.

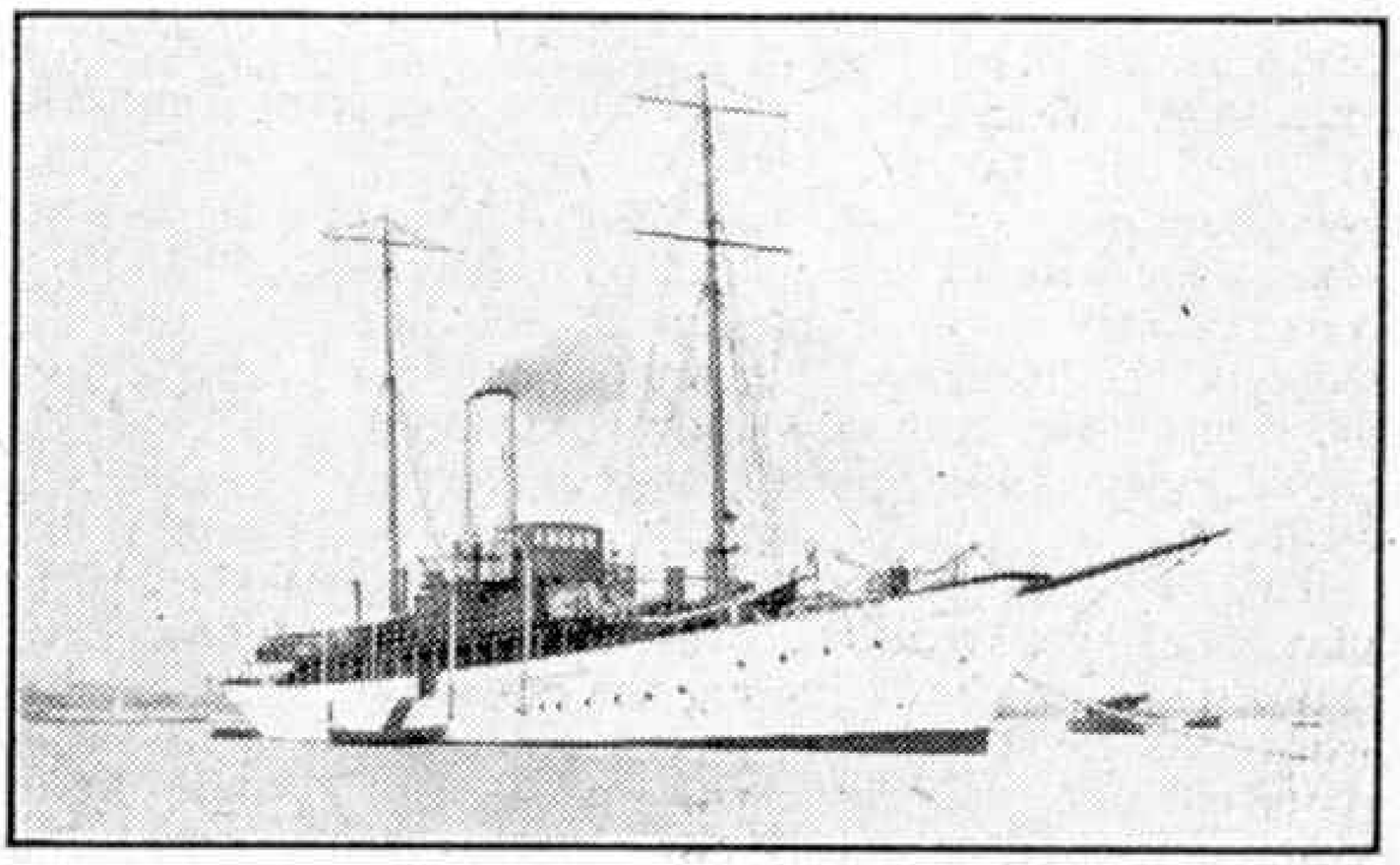
The *"Elettra,"* which is shown in the lower illustration on this page, was acquired by the Italian Government when the inventor died, and became a museum of wireless history. Now she has a successor in the *"Elettra II,"* the fine twin-screw diesel-engined vessel seen in our upper illustration. Originally she was the luxury yacht *"Medina Maid,"* built by J. Samuel White and Co. Ltd. at Cowes. She is 72 ft. in length, with a beam of 15 ft. 6 in. and a draft of 4 ft. 6 in. Her twin Gardner diesel engines each develop 150 b.h.p. at 900 r.p.m. and give her a maximum speed of 11¾ knots. Her cruising range is 1,500 miles at 10 knots.

The second *"Elettra"* is now fitted for advanced experimental work, in actual sea-going conditions, which cannot be done in the laboratory ashore. She will carry out important experiments round the coast of the United Kingdom in marine radar, in direction finding on waves of medium and very high frequencies, and in the operation of various types of transmitters and receivers.

The equipment of the yacht will be varied from time to time, as experimental needs change. She also carries a wide selection of permanent Marconi Marine radio communication equipment and aids to navigation for demonstration purposes.



"Elettra II," the new Marconi Marine research yacht, at speed off Tower Pier. The loop aerial of her direction finder and the scanner of her "Radiolocator" radar are among the distinguishing features of the vessel. Our illustrations are reproduced by courtesy of The Marconi International Marine Communication Co. Ltd.



The first "Elettra," the famous yacht aboard which Marconi carried out many of the experiments that led to radio and radar as we know them to-day.

Railway in the Wilds of Labrador

By Frank Illingworth

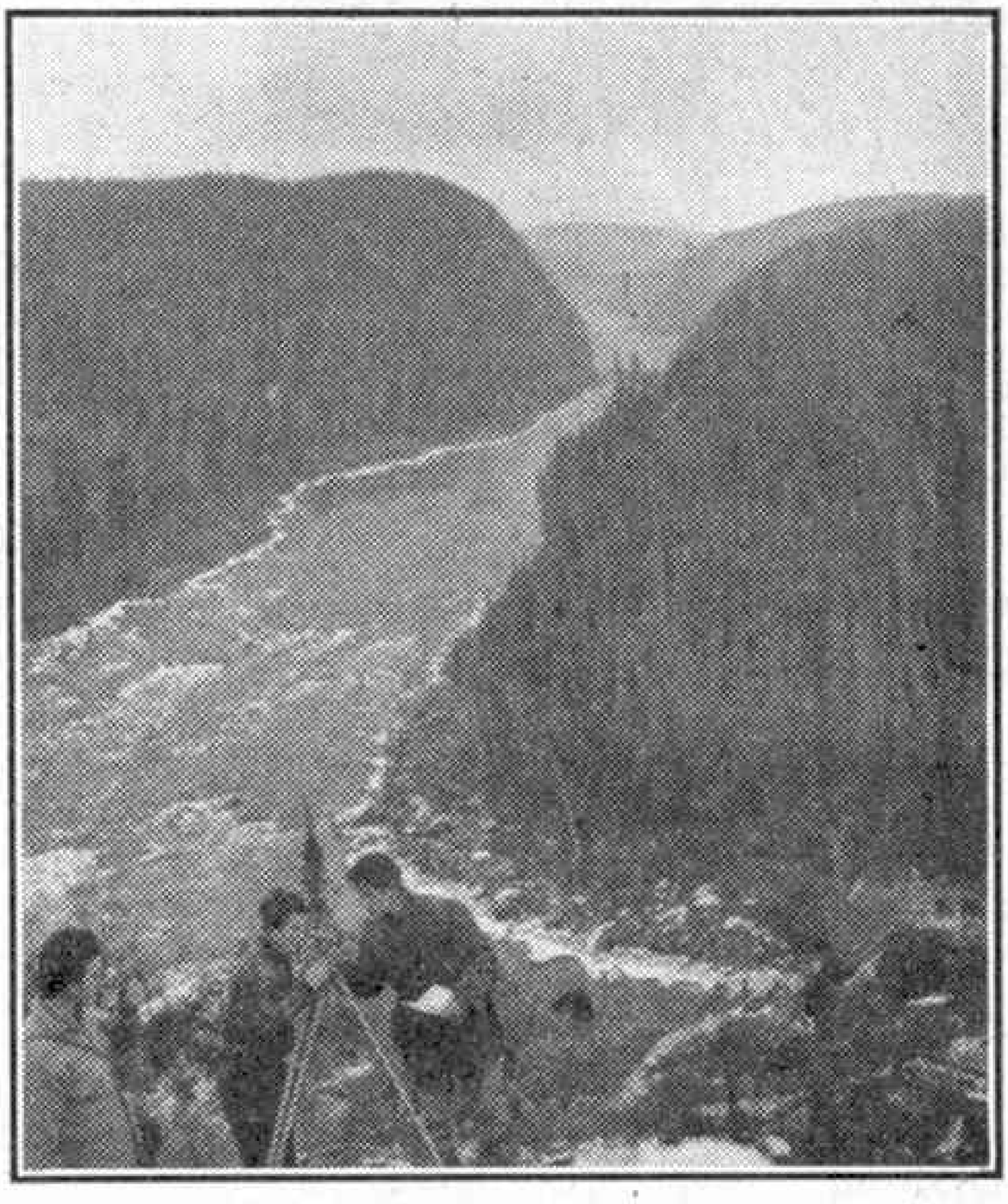
THE predominant sound in the wilds of Labrador these days is the blasting of dynamite, the stutter of power drills and the roar of railway-grading machinery, caterpillar tractors and mobile shovels. After three years of preparatory work Canadian engineers are in full stride towards the completion of a railway between the little fishing port of Seven Islands, on the north bank of the St. Lawrence River, and what are described as "the largest iron ore fields in the world," at a locality known as Burnt Creek.

The plan to broach this great new source of iron, known as the Ungava Ore Fields, is a bold one, for it entails laying rails some 360 miles across uninhabited country that until recently was almost unexplored and is criss-crossed with canyons and fast flowing rivers.

The Chief Engineer at Seven Islands told me: "Some of the difficulties ahead of us on the two-thousand-foot-high Labrador Plateau are as marked as some faced during the construction of the Canadian Pacific line through the Rockies. But we'll have the job completed and the first ore trains running by 1954, partly thanks to an airlift."

This is the first time aircraft have played a key part in the construction of a railway. From the beginning the operative word has been "Haste!" The mounting requirements of the Western Powers' armament industries lent emphasis to the need for speedy broaching of the Labrador iron ore fields. The obvious base for building the railway was Seven Islands. But with the emphasis on haste the engineers decided to work from four bases—northward from Seven Islands, southward from Burnt Creek, and north and south from two intermediate points on the 360-mile route across the Plateau.

The construction of the three latter bases could be accomplished only with the aid of an air lift. Thus the Ungava Project opened with the drone of wings. "Norsemen" floatplanes and helicopters took off from Seven Islands with teams of surveyors, and in the wilderness of the Labrador "Barrens" the latter plotted the route for the track.

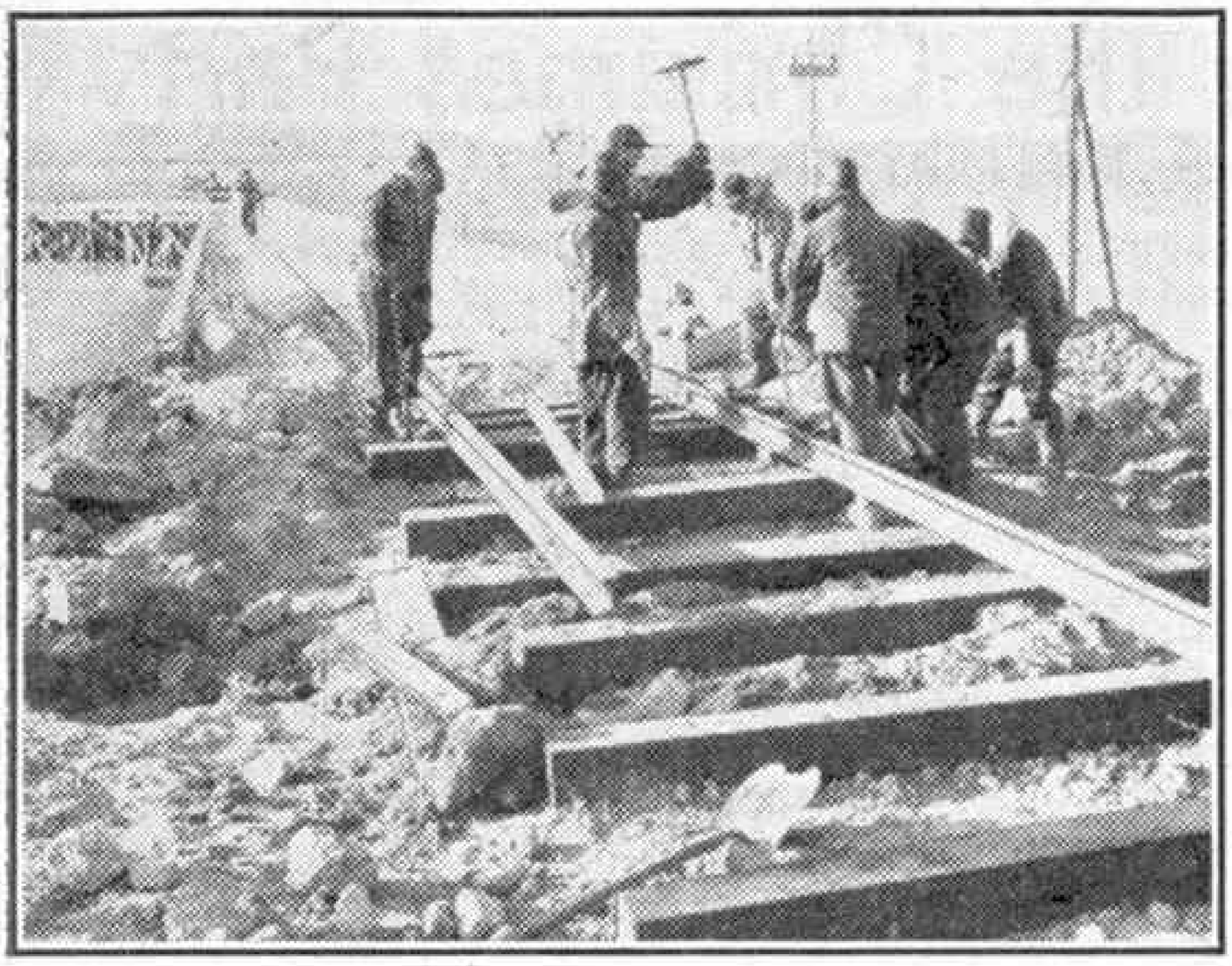


The Moisie River, which is to be crossed by a rail bridge on the Labrador iron ore railway. The railway will follow the curling rapid-cut river for some miles.

Airfield engineers were landed at Burnt Creek and at localities known as Wacouna and Mile 36, on the proposed railway route. The Wacouna air strip was built in 10 days in October 1950 and before the Labrador winter closed in 2,400,000 lb. of railway building equipment had been landed there. In the first 36 hrs. after its completion 3,000 lb. of dynamite were landed.

The heavy railway construction machinery, including two 3/4-yard mobile shovels, had to be dismantled or cut into sections with blowlamps before they could be loaded into the Douglas air transports in which they were flown in. This involved building reassembly shops at Burnt Creek, Wacouna and Mile 36, and when the Labrador spring arrived last May the railway engineers pressed ahead with the actual building work.

The ruggedness of the terrain involves many miles of blasting. Construction of the railway also involves the building of a



Laying the track of the Labrador railway northward out of Seven Islands towards Burnt Creek, centre of the iron ore fields of Labrador.

bridge across the Moisie River. The point selected for the span is nearly half a mile wide, and the approaches are not exactly ideal for bridge construction.

The rails are to weigh 132 lb. per yard. The weight of the metals reflects the fact that wear and tear on the Ungava railway will be heavy. It also adds to the problem of air transport, for nearly every yard of rail must be delivered by air freighter.

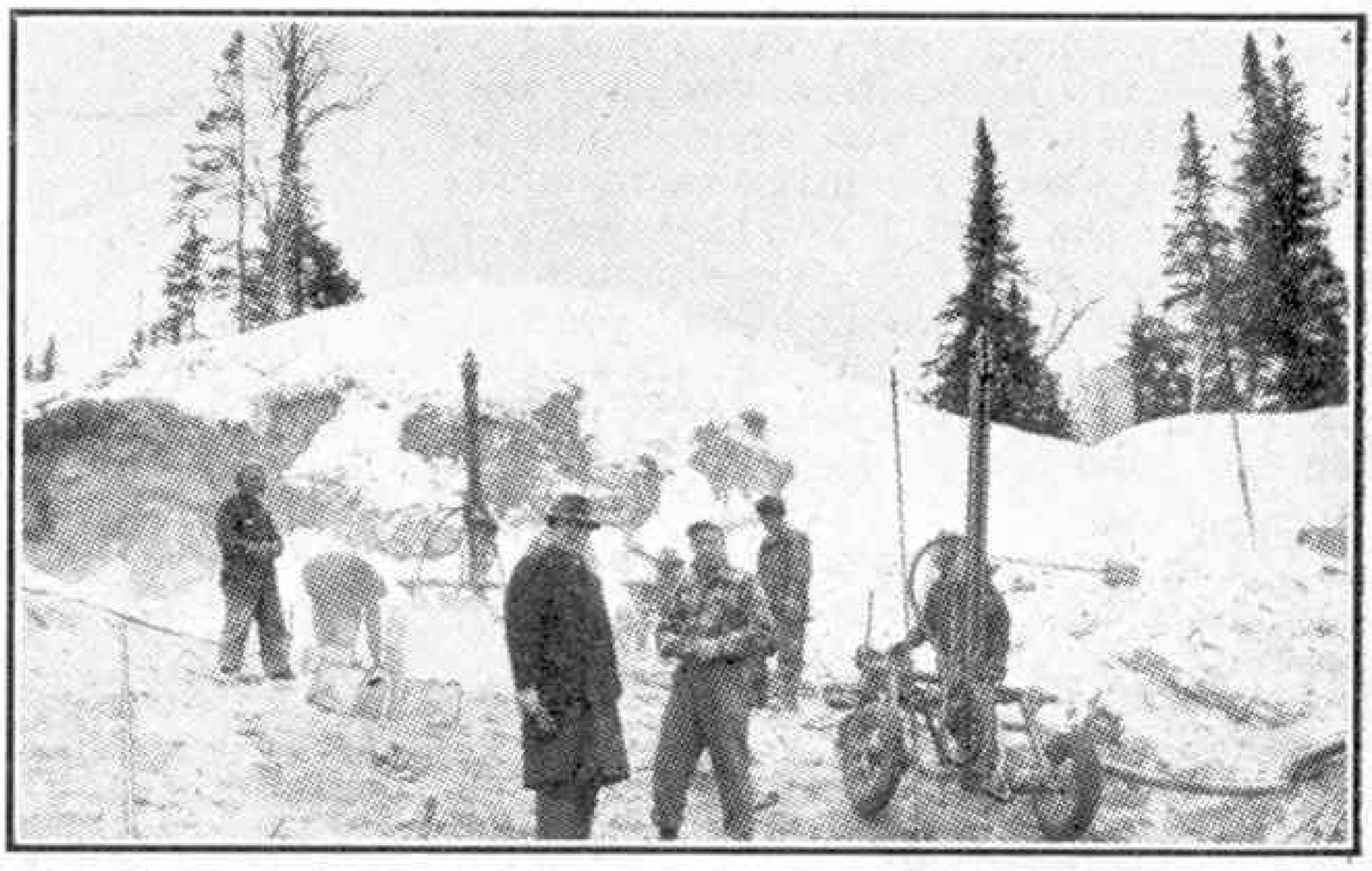
Work on the construction of railway sheds and sidings at Seven Islands started last summer, with equipment and material brought in down the St. Lawrence from Montreal by steamer. Diesel locomotives will be used when the line is in operation and the ore trucks will be of the design generally employed on the American continent.

When the Ungava project gets into its full stride the railway will handle some 20 million tons of ore during the five months of the Labrador summer. Mining operations would be possible in winter, and it would also be possible to operate the railway. Unfortunately, the cold of the Labrador winter would freeze the contents of the ore trucks into a solid mass impossible to move without the aid of dynamite. For this reason only maintenance gangs will be kept at work during the severe winter months.

The busiest time of the year will be the six weeks prior to the closing of the St. Lawrence by ice. For Seven Islands will be in operation for six weeks after the last ore of the season has been loaded into the trucks at Burnt Creek, and during this period the railway will be operating at full pressure in an effort to pile up at Seven Islands sufficient ore to keep the sidings there busy until ice finally closes the port for another six or seven months.

The railway will be supported by aircraft of Canadian Pacific Air, which has already begun to operate a scheduled service to Burnt Creek. They will link at Montreal with the Trans-Canada Airlines network and the B.O.A.C. London-Montreal Service, so that one will be able to fly by passenger aircraft into the barren heart of Labrador.

The Ungava Project is an example of what can be accomplished by a sensible combination of private enterprise and the activities of governmental departments. With a view to the speedy construction of the railway the Canadian Department of Transport has considerably extended the airfields at Seven Islands, while the departments for Mines and Resources, Resources and Development and Technical Service have lent their assistance in railway and geological survey work.



Men and gear were flown to a temporary airstrip to work on construction of the railway to Burnt Creek.

Easy Tricks for the Christmas Party

By Norman Hunter (from Maskelyne's Mysteries)

LET us begin this year's magical performance in what is, perhaps, the most logical way, with

SOME TRICKS WITH THE MAGIC WAND

You begin by producing the magic wand. You simply take it out of a purse. And as the purse is very small and the wand well over a foot long and solid wood, this nice simple trick becomes decidedly un-simple as far as seeing how you did it is concerned.

Having had the wand examined—no,

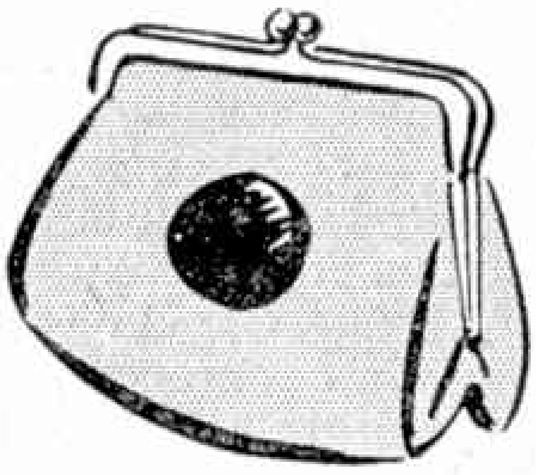


FIG 1

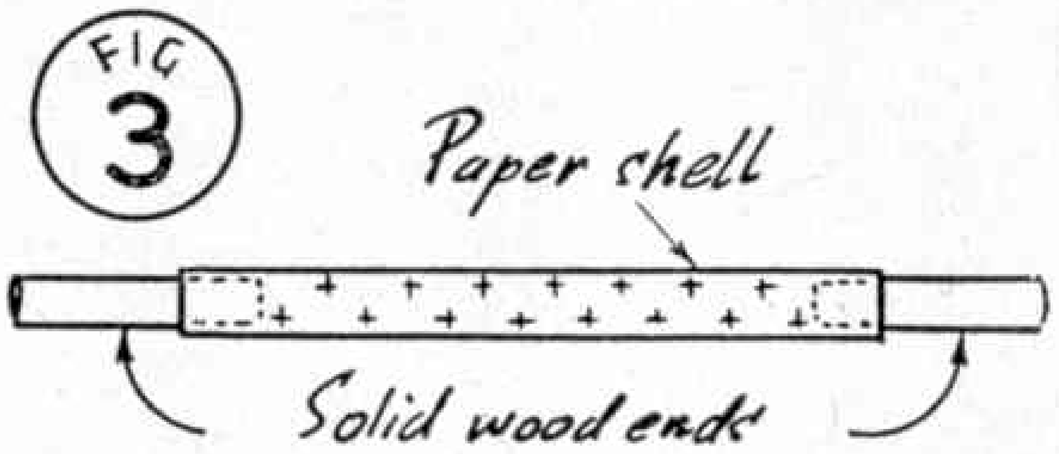
Hole in side of purse

it doesn't fold up, close up or do anything else that an ordinary wooden rod won't do—you then wrap it in a piece of tissue paper. "A magic wand is a wonderful thing for wandering" you remark. You crush the paper into a ball and produce the wandering wand from the back of your neck.

For the next trick you roll a sheet of paper into a tube and push the wand into it, leaving several inches of the wand protruding from the tube. With another sheet of paper then make another tube, a rather wider tube this time, into which you tuck a Union Jack.

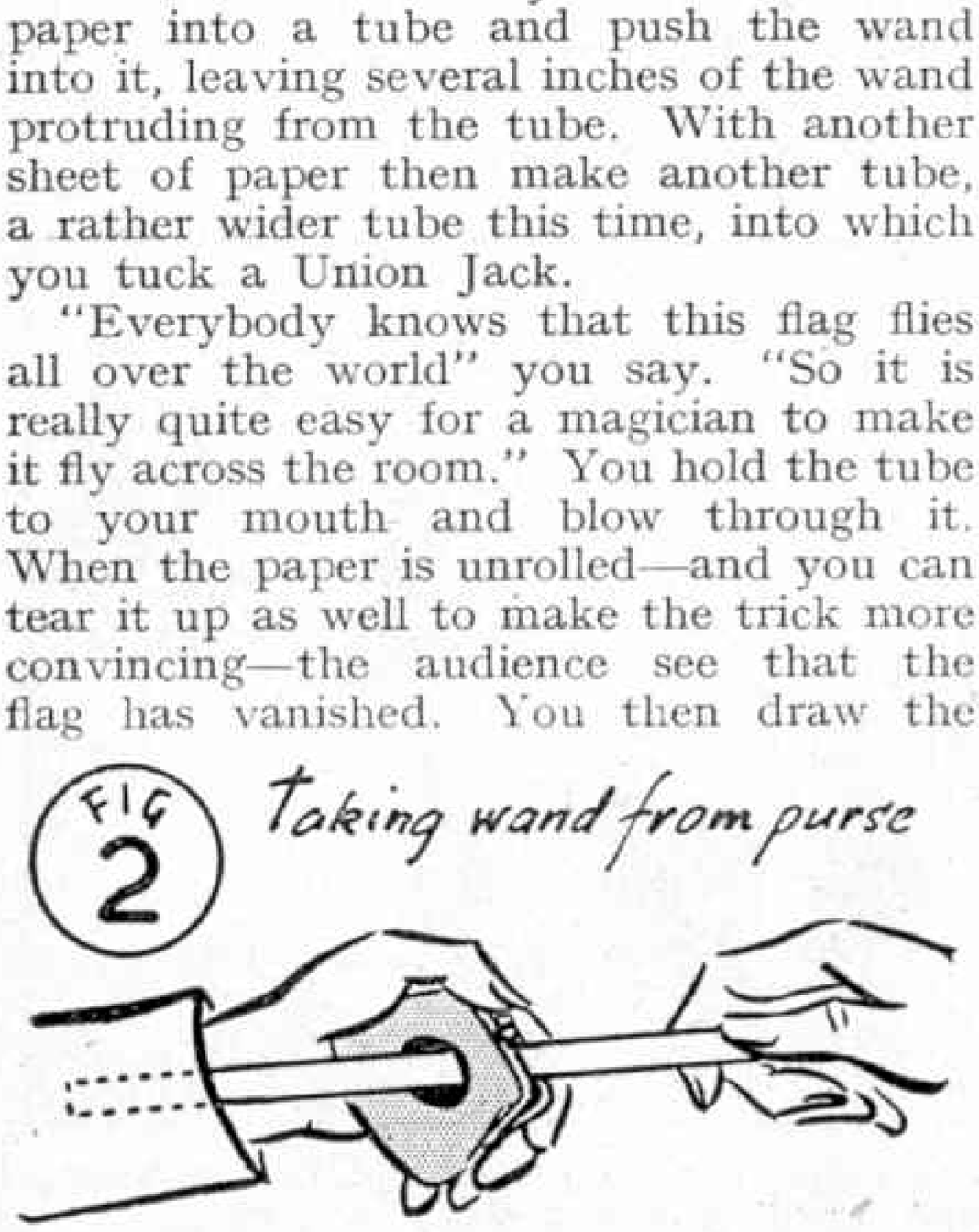
"Everybody knows that this flag flies all over the world" you say. "So it is really quite easy for a magician to make it fly across the room." You hold the tube to your mouth and blow through it. When the paper is unrolled—and you can tear it up as well to make the trick more convincing—the audience see that the flag has vanished. You then draw the wand out of the other paper tube and there is the flag, fixed to the wand as if it were a flagstaff.

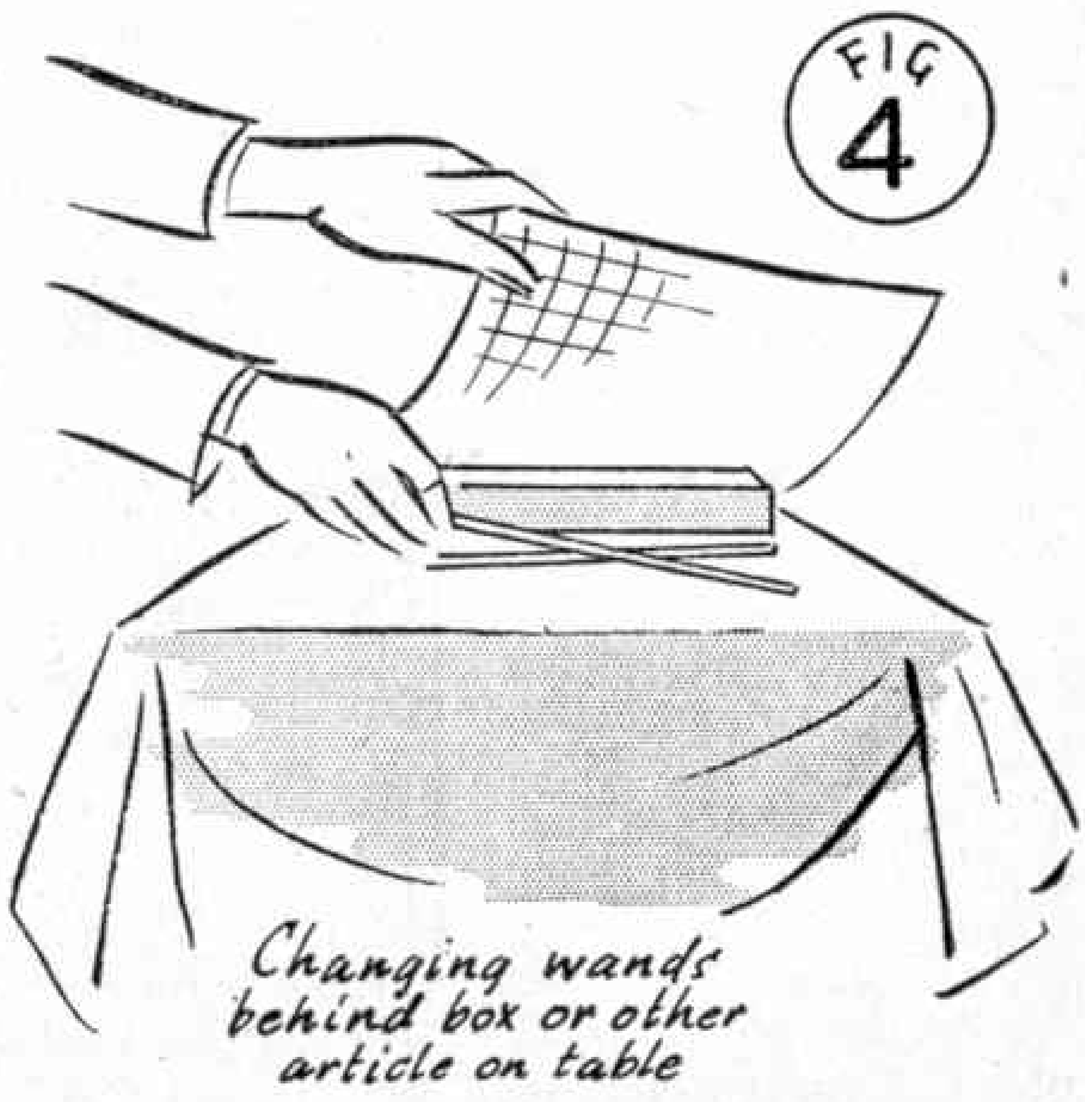
How it is done. For the first trick you need a small, ordinary purse. Cut a hole

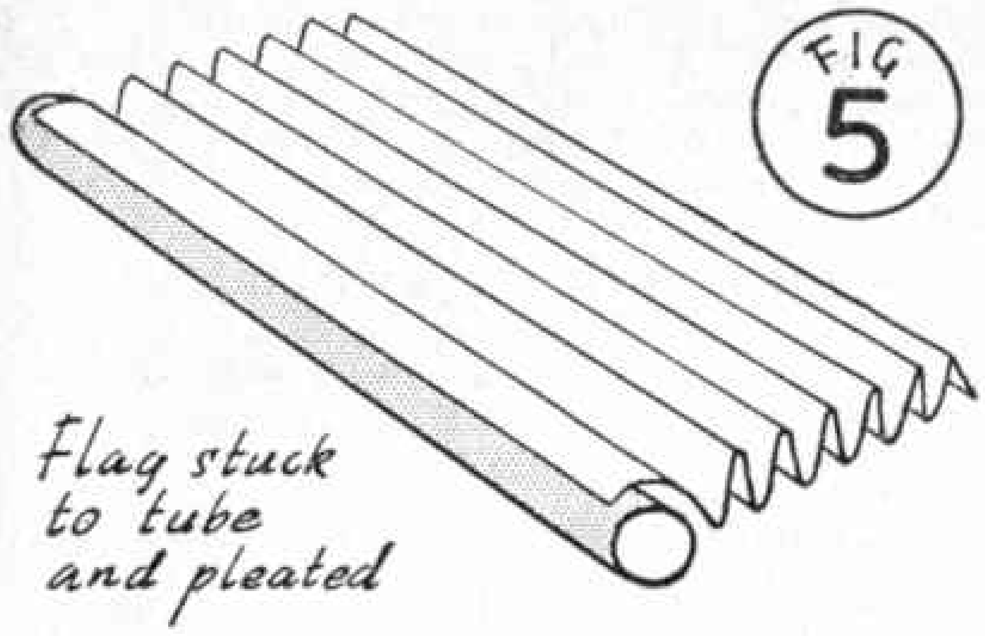


in one side of the purse, big enough for the wand to go through it easily. The wand is simply a piece of wooden rod about half an inch in diameter and sixteen inches long. The conventional magic wand is black with white tips, but if you can get some fancy paper with coloured stars on it you can make a more cabalistic looking wand. Paint the ends of the rod white and stick the paper round the centre part. The ends should be about two inches long.

To prepare for the trick slide the wand up your left sleeve and let the end rest in the palm of your hand. Put the purse in your right side pocket. To do the trick you take the purse from your pocket with your right hand, keeping the hole concealed, and place it in your left hand. As you do this you will find it quite easy to slip the end of the wand into the hole.

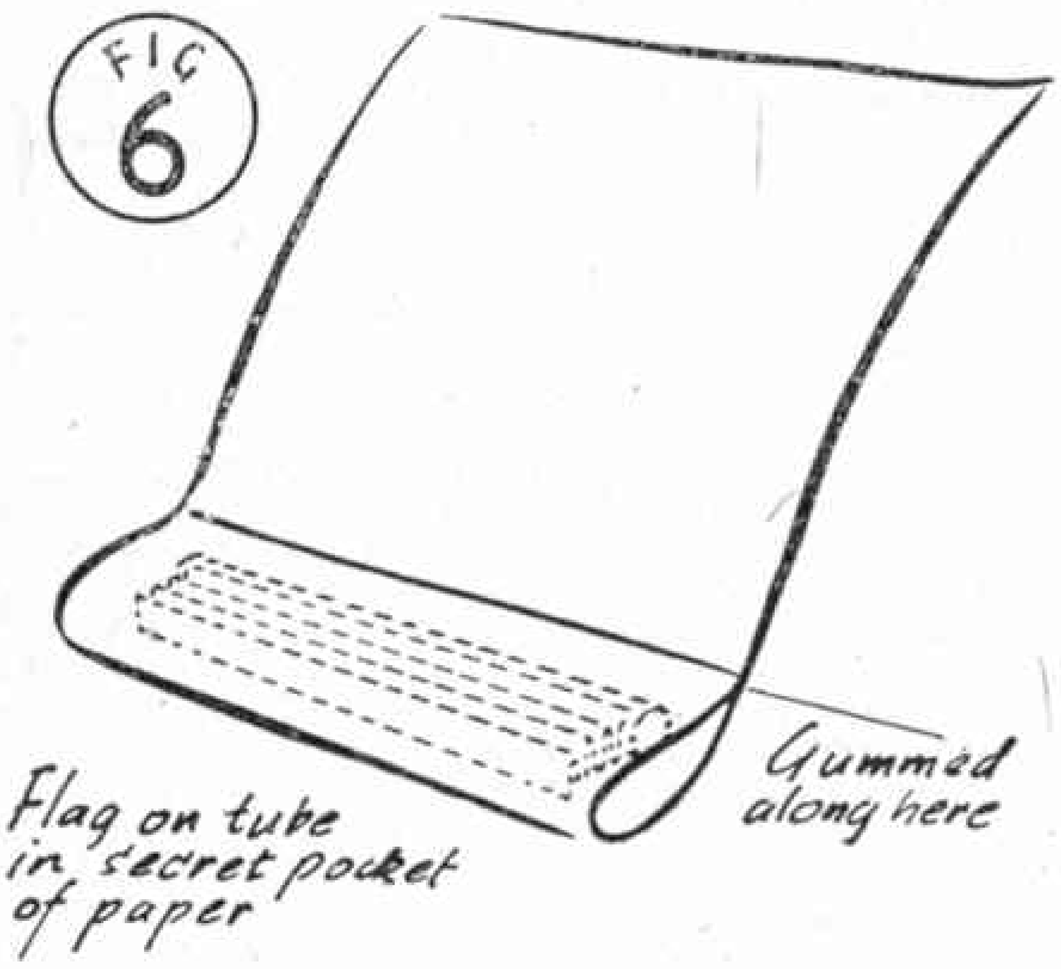






Now open the purse with your right hand and draw the wand out. Put the purse in your pocket again and hand the wand for inspection. (Figs. 1 and 2).

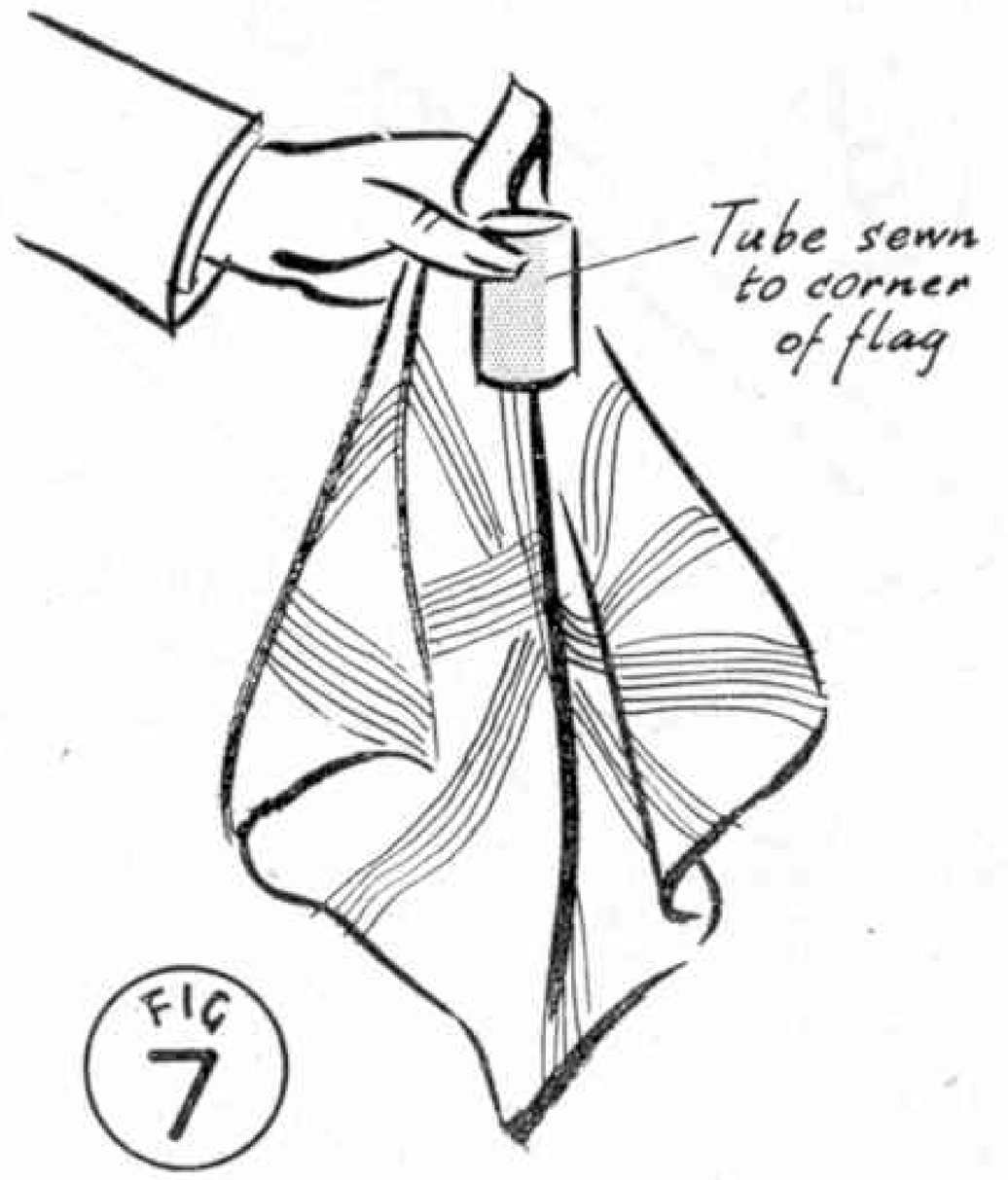
For the vanishing wand you need a special wand that looks like the solid one, but is really a hollow sham. Make two wand ends from the same kind of wooden rod as you made the wand from. These should be just over two inches long. Now roll several paper shell wands from your fancy paper. Roll these round another length of the same rod and gum the ends down. Press one wooden end into each end of the shell and you have a wand that looks solid and can be rapped on the edge of a tumbler and sound very solid, yet, when it is wrapped in paper, can be crushed into a ball.



When you receive back the solid wand from whoever is examining it, you carry it to your table and, in the act of picking up the tissue paper, change the solid wand for the shell. The shell wand is lying behind some article on your table, and you have ample time to put down the solid wand and pick up the shell while you are taking up the paper.

The wand produced from the back of your neck is another solid wand made in the same way as the first, so for these two tricks you want two solid wands, two wooden ends and a supply of shells, because of course you destroy a shell every time you do the trick. (Figs. 3 and 4).

Now for the flag trick. You will need two small flags, both alike. They need not

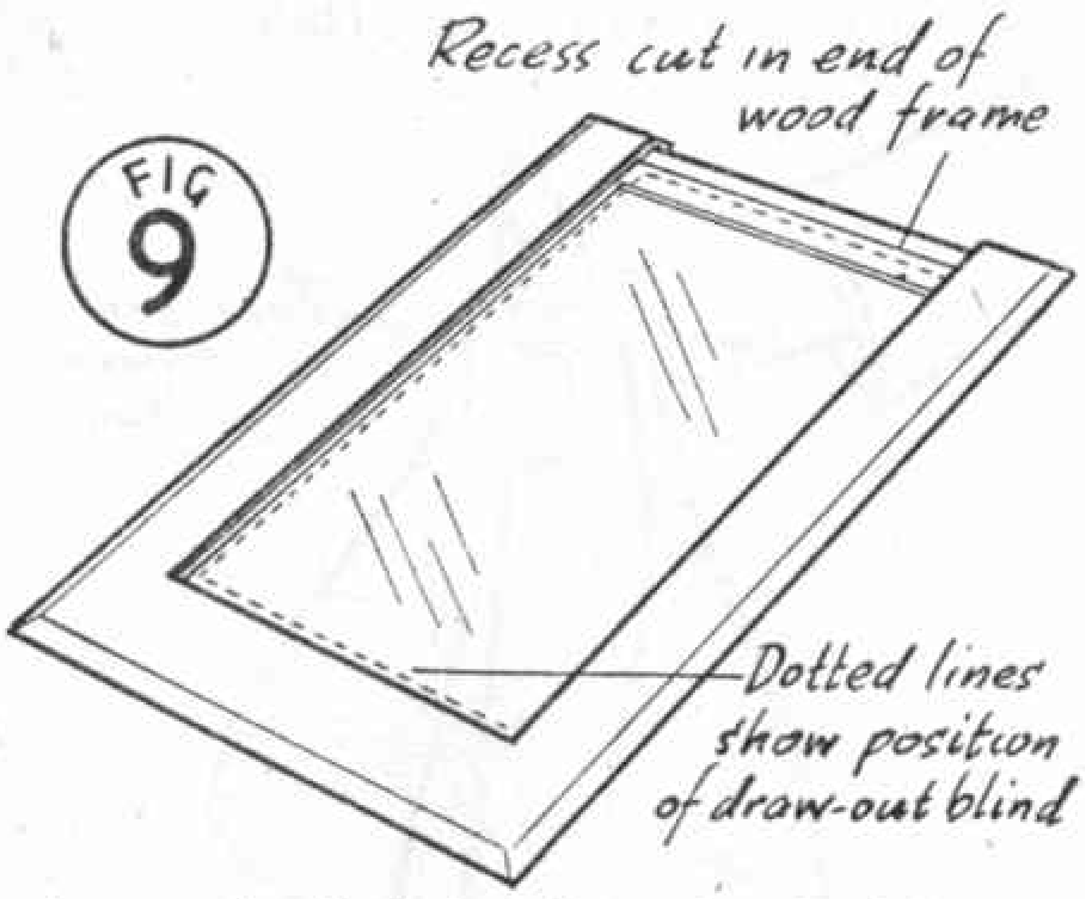


be silk, but should be of some fine, thin material. If necessary you can use paper flags, but flags made of some material are better.

One of the flags is stuck to a stiff paper tube just large enough to slide easily over the wand. Use plain white paper for the tube and plug one end with a little piece of wood. The sheet of paper from which the tube is made has a pocket down one

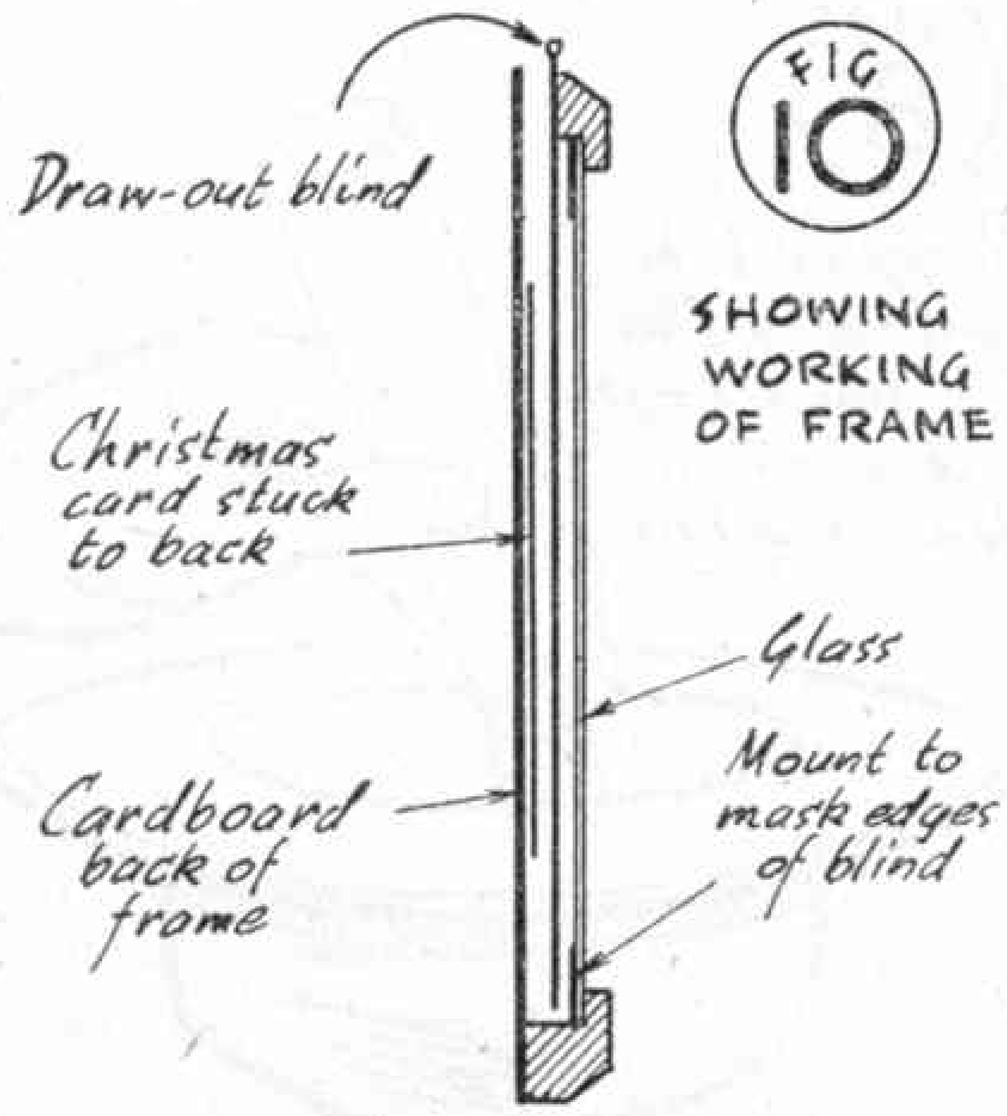
side, formed by folding the paper over and sticking down the edge.

Fold the flag in concertina folds against its tube and slide the long, thin package so formed into the secret pocket on the paper. When you pick up the paper to make the tube in front of the audience, wave it casually about and refer to it as "just a sheet



of paper, the kind of stuff people write letters on. But as I am a man of magic, not a man of letters, I use it for something quite different." Roll up the paper loosely and put an elastic band round it. Then slide the wand into the tube, sliding it also into the tube to which the flag is attached. When you have vanished the other flag all you have to do is to draw out the wand, taking care to get hold of the flag at the same time and so produce the flag apparently attached to the wand. (Figs. 5 and 6).

Vanishing the flag from the other paper tube is even easier. Make a small short cardboard tube just large enough to hold the flag. (This trick seems to be as full of tubes as an underground railway, doesn't it?). Sew this tube to one corner of the second flag and lay the flag, slightly crumpled, on your table, with the tube hidden underneath. Roll up a tube from another sheet of paper. Pick up the flag, taking care that the tube does not show. Hold the flag by the corner where the tube is attached. As you tuck the flag into the tube, slide the cardboard tube in first, then tuck the flag snugly into the cardboard tube. Now, holding the paper tube with the flag inside in your right hand, pick up with the same



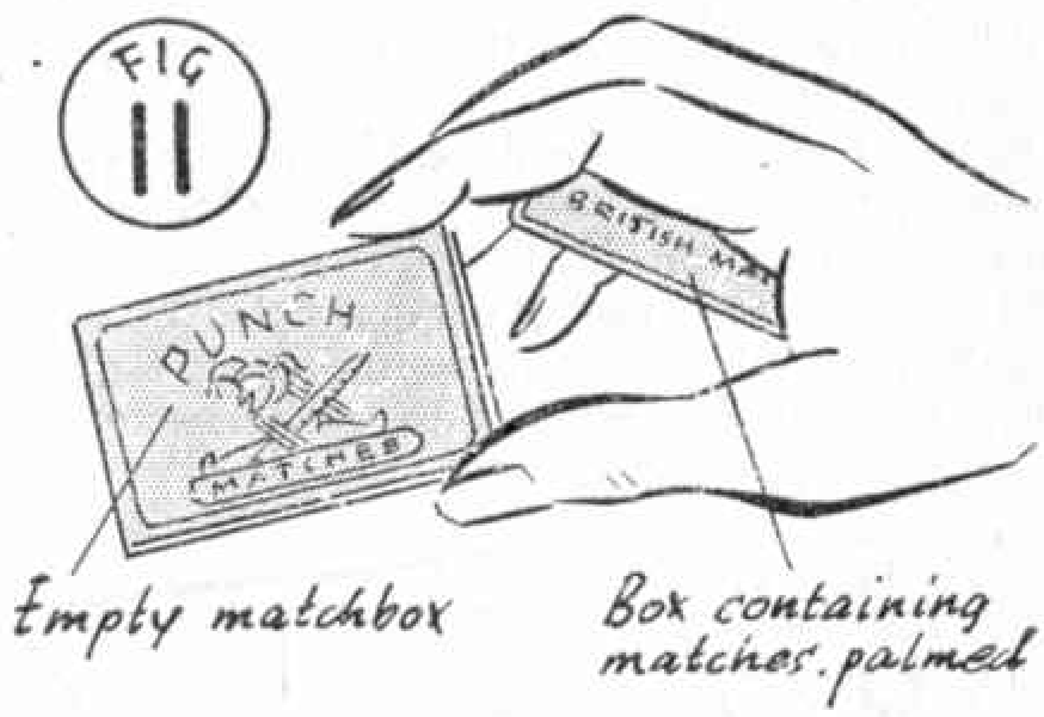
hand another elastic band which is resting on the brim of a hat. As you pick up the band you allow the tube containing the flag to slide into the hat. Now snap the band round the tube and the whole trick is over except for magic passes and mysterious word chanting. (Figs. 7 and 8).

A TRICK WITH A CHRISTMAS CARD

"Everybody gets Christmas cards at this time of the year" you say, "but nobody knows what to do with the things after Christmas. Nobody, that is, except me. I do conjuring tricks with them. Let me show you one."

You exhibit a small picture frame which is quite empty. You cover it with a cloth and give it to someone to hold. You then display four Christmas cards, each with a different design upon it. A member of the audience chooses one card, which you burn in a small ash tray; then, sprinkling the ashes over the covered frame, you remove the cloth and there is the chosen Christmas card, fully restored, inside the frame.

How it is done. The choice of card is of course forced; that is to say you arrange matters so that the audience choose the particular card you want them to choose. There are several ways of doing this; here is one of the easiest. You lay the four cards, faces down, in a row. Then you ask someone to choose a number between one and four. As there are only two numbers between



one and four, the choice must be either two or three. You count along the row until you reach the chosen number, and, according to which end of the row you count from, you can always arrange for the choice to fall on the card you have previously placed in that particular position.

So much for the forced choice. Now for the frame. You can make this quite easily from a wooden photo frame. Remove the back, glass and mount. Now cut away a portion from one end of the wooden frame, down to the level of the back surface of the glass, when in position. (Fig. 9). Replace the glass, then the mount, and run a piece of gummed paper round to keep them in place.

Next cut a piece of thin dark material to the same size as the glass, and sew a small ring or button in the middle of one end. This is a sort of blind that, when the frame is put together, can be used to hide whatever is in the frame and drawn out at the appropriate time to reveal it.

Cover the inside of the backing of the frame with the same material as the blind, and stick a duplicate of the card to be chosen to this back. To set the frame, lay the blind in position, replace the back and fasten it with small drawing pins or with clips. Do not fix it permanently, because you will have to take it off whenever you want to replace the blind in the frame.

You can now show your frame; and the blind covering the card will make the frame appear empty. Cover it with a cloth as already described. When you have forced the choice of the card, and having done the burning and ash-sprinkling business, remove the cloth from the frame. As you do this, nip the ring or button on the blind (*Continued on page 572*)

A Great New Steel Works

Reducing White Hot Slabs to Gleaming Coils

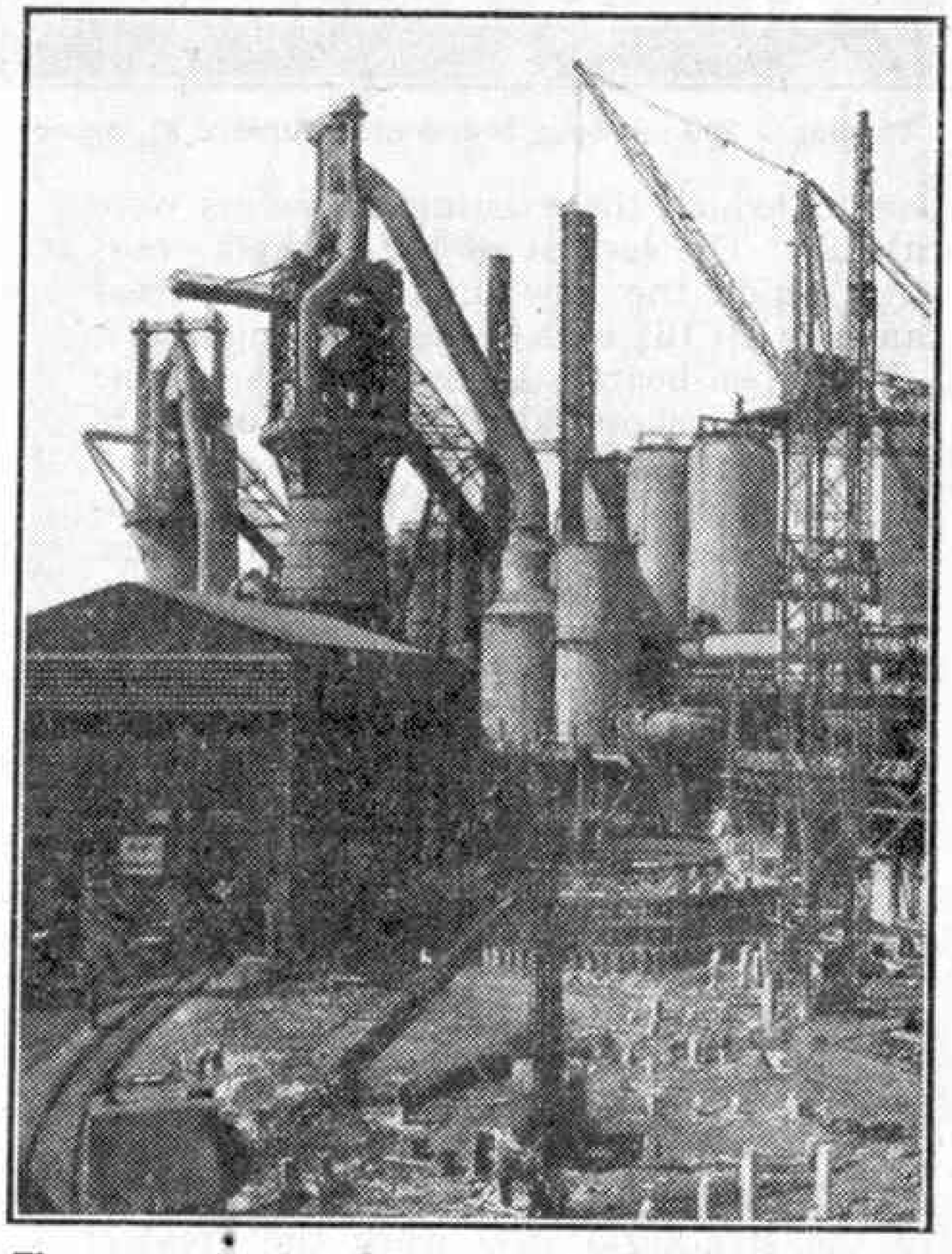
IN July last a great new scheme for the production of steel and tinplate was officially opened by Mr. Hugh Gaitskell, then Chancellor of the Exchequer. This ceremony took place in the new Abbey Steel Works at Port Talbot, in South Wales, where Mr. Gaitskell started a massive slab of steel on its long journey through the newly completed strip mill. In the course of this journey the slab was converted into a thin coil of gleaming steel that was taken to the South Bank Exhibition of the Festival of Britain for display there as an outstanding example of British industrial enterprise.

For many years South Wales has been the home of the British tinplate industry, and when the war came to an end it was clear that more modern methods were required. What in particular was wanted was an up-to-date wide continuous strip mill, for the production of steel sheet for tinplating and other purposes. This reconstruction was a huge task that involved the spending of £60,000,000. Four steel and tinplate companies were concerned in it. Together they formed the Steel Company of Wales, bringing with them into the new organisation resources valued at more than £10,000,000. These included steel works at Margam and Port Talbot, 18 tinplate works in West Wales and a sheet steel works at Newport.

At the Margam Works it was decided to reconstruct and enlarge the blast furnaces and other departments so that more pig iron could be produced, and to build a new continuous strip mill, with a melting shop and other plant alongside. The Abbey Works, as these were named, and the reconstructed Margam Works were then to form one unit that when completed would extend for 4½ miles and would be capable of producing 1½ million tons of steel ingots a year.

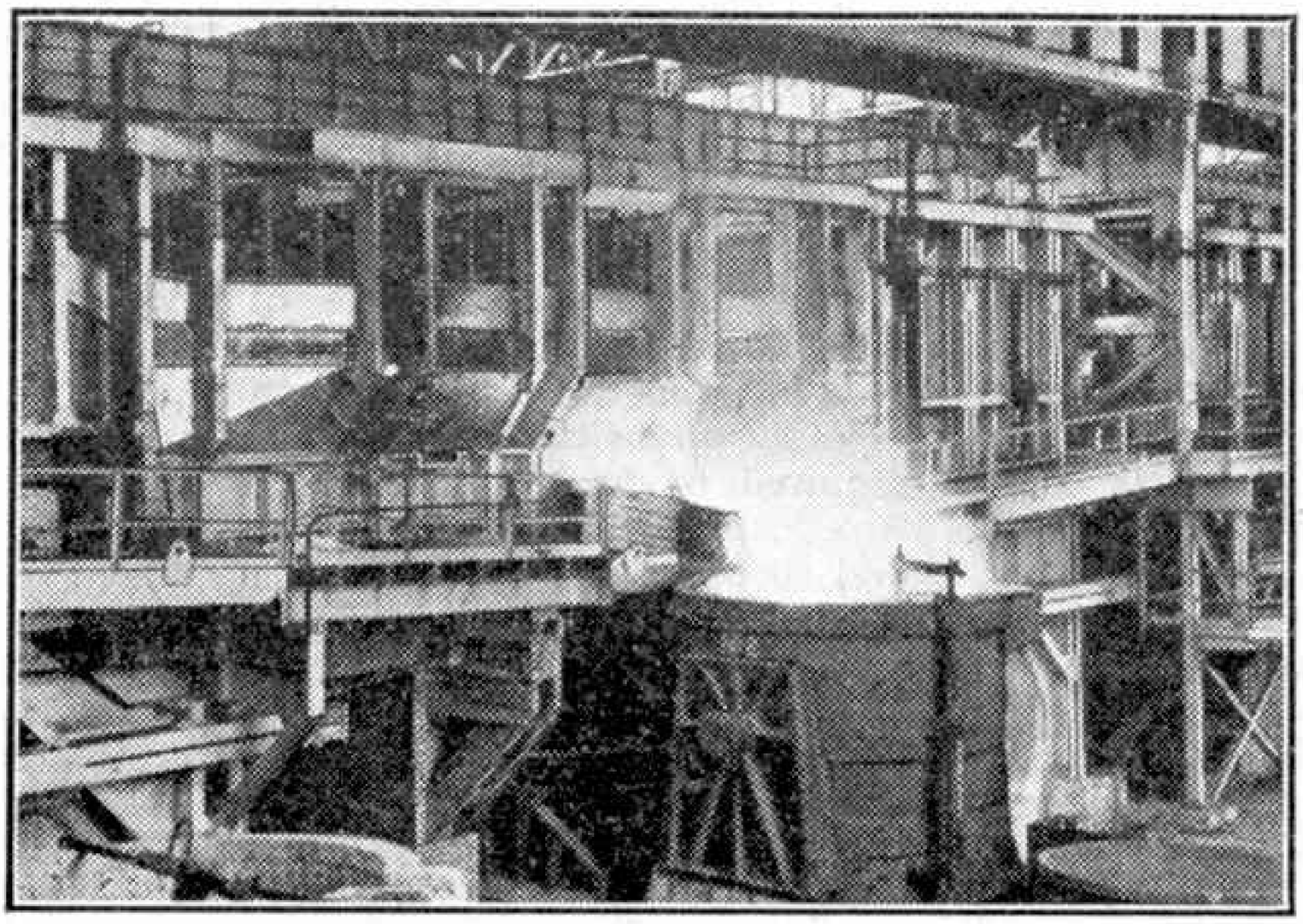
The Margam Works had to be reconstructed without interfering with the work of the existing plant, and in fact while the work was in progress there was a steady rise in production. The blast furnace capacity has been greatly enlarged. The first of three new furnaces, with a hearth diameter of 21 ft. 6 in. and a capacity of 700 tons of pig iron a day, was "blown-in," or set to work, five years ago. Then a second furnace, with a diameter of 16 ft., was pulled down and in its place an even larger one with a hearth measuring 25 ft. 9 in. across was constructed. This came into operation in November of last year, and on the following day the dismantling of the third existing furnace began in preparation for the erection of yet another 25 ft. 9 in. furnace. Each of these two larger furnaces is capable of producing 1,000 tons of pig iron a day, making a total of 2,700 tons daily from the three.

Vast quantities of raw material are required to feed the new blast furnaces. Ample supplies of coke are necessary and so 90 coke ovens have been added to the 54 already in operation, to produce 15,000 tons a week. To make this about 22,000 tons of coal have to be brought every week by rail from South Wales



The two new blast furnaces at Margam Works, South Wales, with the foundations for a third one. These three furnaces will have a capacity of 2,700 tons of pig iron a week. The illustrations to this article are reproduced by courtesy of the Steel Company of Wales Ltd.

Collieries. Huge quantities of iron ore and linestone also are required. The limestone comes from the Company's own quarry, about six miles away, which has been completely mechanised. Part of the ore comes from Oxfordshire and part is brought to the wharf at Port Talbot from overseas, there to be dealt with by new giant unloaders that can handle 500 tons an hour, compared with the 250 tons an hour of which the existing unloaders were capable. The largest of the various grabs with which the new unloaders are fitted can pick up 12½ tons of ore at a single bite.



Tapping a 200-ton open hearth steel furnace at the new Abbey Works.

The open-hearth steel furnaces in the old melting shops at Margam Works are being reconstructed, with a capacity of 80 tons each, and much larger new oil-fired furnaces are being installed in the new Abbey Works melting shop. When the scheme is complete there will be eight of these, each of 200 tons capacity.

The new Works in which these are being erected have been built on a narrow marshy coastal site, the whole of which, 550 acres in extent, was raised from 10 to 12 ft. above its normal level by placing 4½ million cu. yds. of filling, chiefly sand from the dunes and slag from old tips and from current production. On this raised site the Abbey Works rest on piles from 20 to 50 ft. in length, driven down until they reached sandstone or hard shale, the number used being 33,700. In the structural steel work the greatest possible use was made of welding, with a great saving in weight in comparison with that of a riveted structure.

Hot metal from the Margam blast furnace is taken by rail to the Abbey Works Melting Shop, and there is poured into one of two elevated mixers, each of 800 tons capacity, which can deliver it direct to the ladles that carry it to the oil-fired open hearth furnaces. An electric locomotive hauls the cars along, stopping opposite the furnace for which the iron is required. The necessary scrap is sorted in the scrap marshalling yard, and is then pushed in train loads up a ramp to be loaded into the boxes at the stage level, from which it can readily be fed into the furnaces, where pig iron and scrap are melted down to form steel. Some idea of the scale of these operations is given by the fact that 5,000 gallons of oil are burned for each charge.

When a furnace is tapped the 200 tons of steel it yields in a single melt is run out into one ladle. The ladle alone weighs 65 tons, so that a crane with a capacity of 300 tons is required to lift one when full of molten steel. The cranes themselves weigh about 410 tons, so that the total weight on the crane girders is then more than 700 tons. To carry this enormous weight 22 of the largest welded girders ever made have been installed. The longest of these are 100 ft. long and weigh over 90 tons.

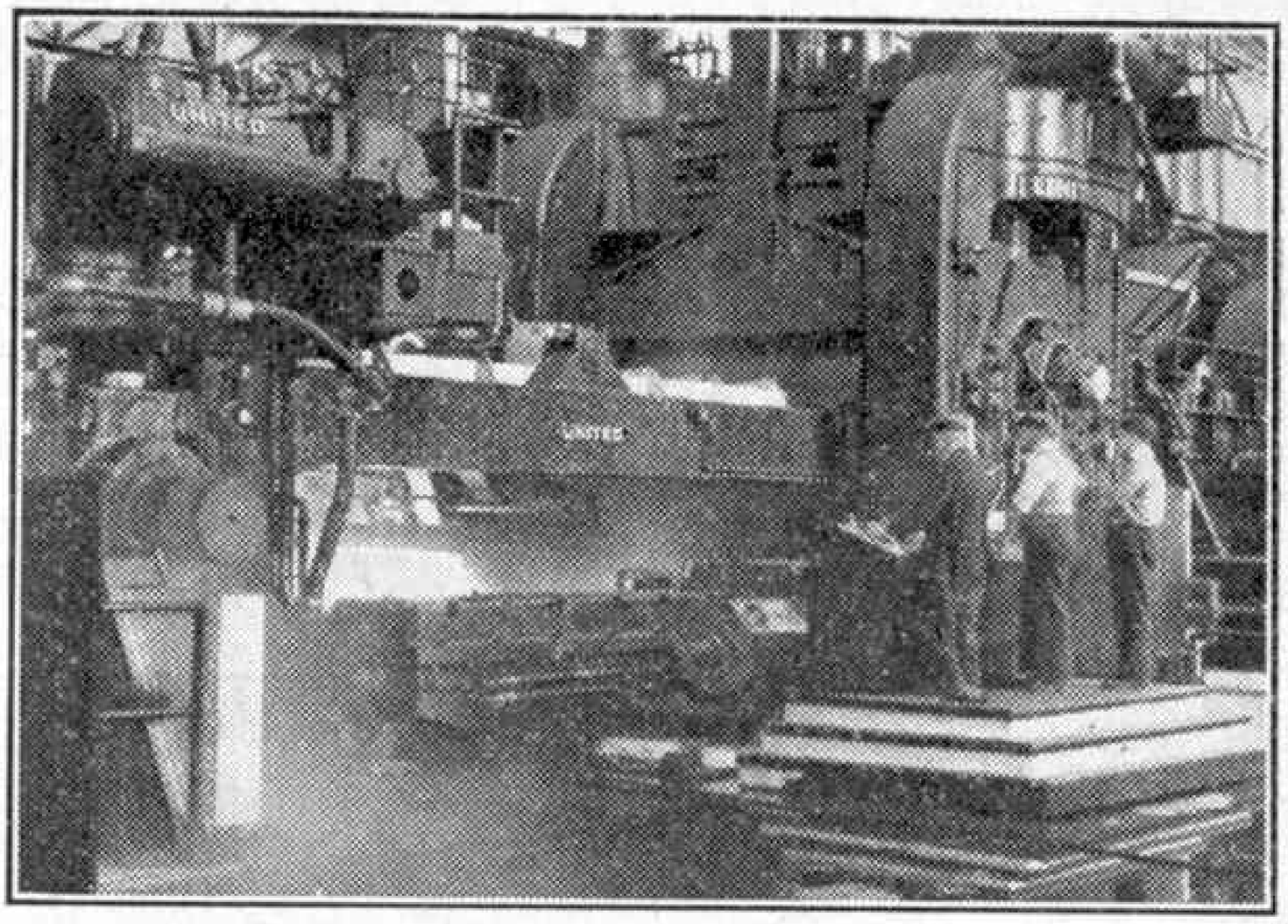
The moulds in which the ingots are formed stand on bogies while the molten steel is being "teemed" or poured into them, and the largest ingot cast is one of 20 tons.

From the melting shop the moulds are hauled to a special bay where two giant cranes strip them and charge the ingots into the soaking pits, in which they are heated ready for rolling. The pits are fired by coke oven and blast furnace gas, and from them the ingots when required are carried to the rolling mill on a 100-ton buggy, which stops automatically, controlled by an electric eye, at the soaking pit where it is needed. When reconstruction is complete there will be 20 pits in the Works, each 11 ft. deep, 15 ft. 3 in. long and 14 ft. 3 in. wide.

After reheating the ingots are ready to be rolled into slabs, but they are first weighed and then pass on to a device

that turns them round so that they enter the slabbing mill, the first stage of their journey, with their wider ends first. The rollers of this mill are nearly 4 ft. in diameter, driven by two 4,600 h.p. motors, and they can produce slabs up to 5 ft. in width and 8½ in. in thickness. On emerging from this mill the slabs are edged and trimmed to size, after which they are weighed and taken out to the slab yard.

When the time comes for the slabs to be reduced further to steel strip they enter one of four reheating furnaces, which can be fired by gas or oil and raise the temperature of the slabs to 2,350 deg. F. The slabs are pushed into the back of the furnaces and moved on watercooled skid rails along the whole length, until they reach the door through which they are discharged. Each slab pushes the one before it a stage further along the rails, and when the furnace is full, putting in a fresh slab causes one to be discharged at the front.

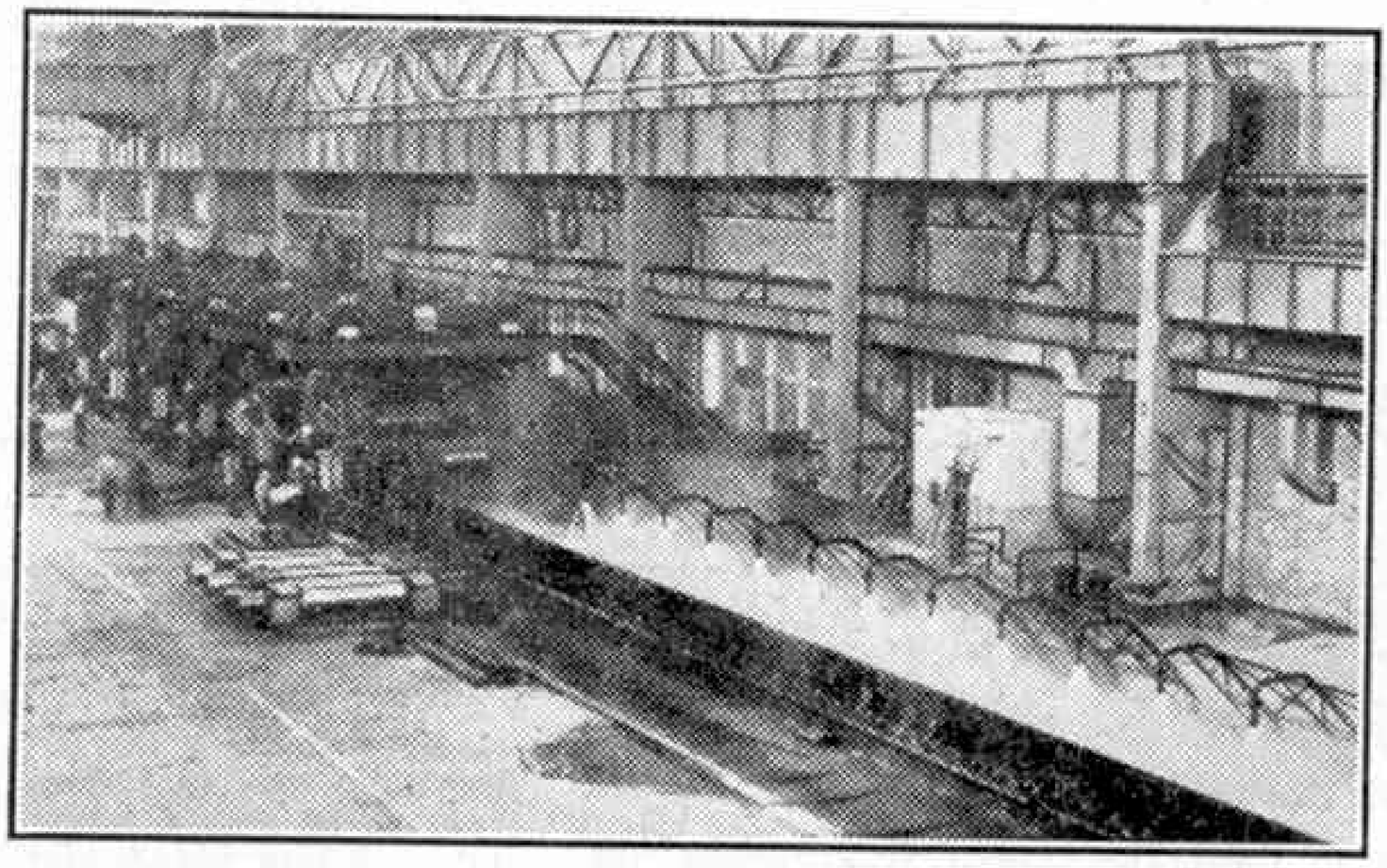


A reheated slab of steel entering the Broadside Mill, the first roughing stand in the mill in which it is reduced to a steel strip.

From the furnace each white hot slab is carried on rollers to what is called the hot strip mill, on reaching which it enters on the wonderful process of transformation into a ribbon of steel. The reduction is made in stages by passage through several stands of giant rollers, those of each stand turning faster than those of the one before it as the steel ribbon is stretched out by the tremendous pressure it undergoes. First it passes through a Scalebreaker, which removes the scale formed in the reheating furnaces. Then it enters the first roughing stand. This is called the Broadside Mill, as the slab can be passed through it sideways if the width is to be increased up to 6 ft.

From the Broadside Mill the slab passes through an edge squeezer and then through three more roughing stands, each of which has an edging mill built in with it. Between the last roughing stand and the first stand of finishing rolls there is a delay table. This is 186 ft. long and its purpose is to allow the temperature to be controlled before entering the finishing mill. In this there are six stands, through which the strip passes in turn, emerging from the last of them at a speed of 2,000 ft. a minute. By then it may be anything up to 900 ft. long, with a width of 6 ft. and a thickness of a tenth of an inch, and finally is wound into a coil.

Further reduction of the strip is effected by rolling in the cold reduction mill. At Margam this is carried out on a three-stand mill that produces wide sheets suitable for making motor car bodies, metal furniture, refrigerators and similar products. Another new mill at Trostre, with five stands, reduces the strip in readiness for the manufacture of



Steel strip emerging from the last finishing stand of the hot strip mill, with high pressure water sprays playing on it to cool and descale it.

(*Continued on page 572*)

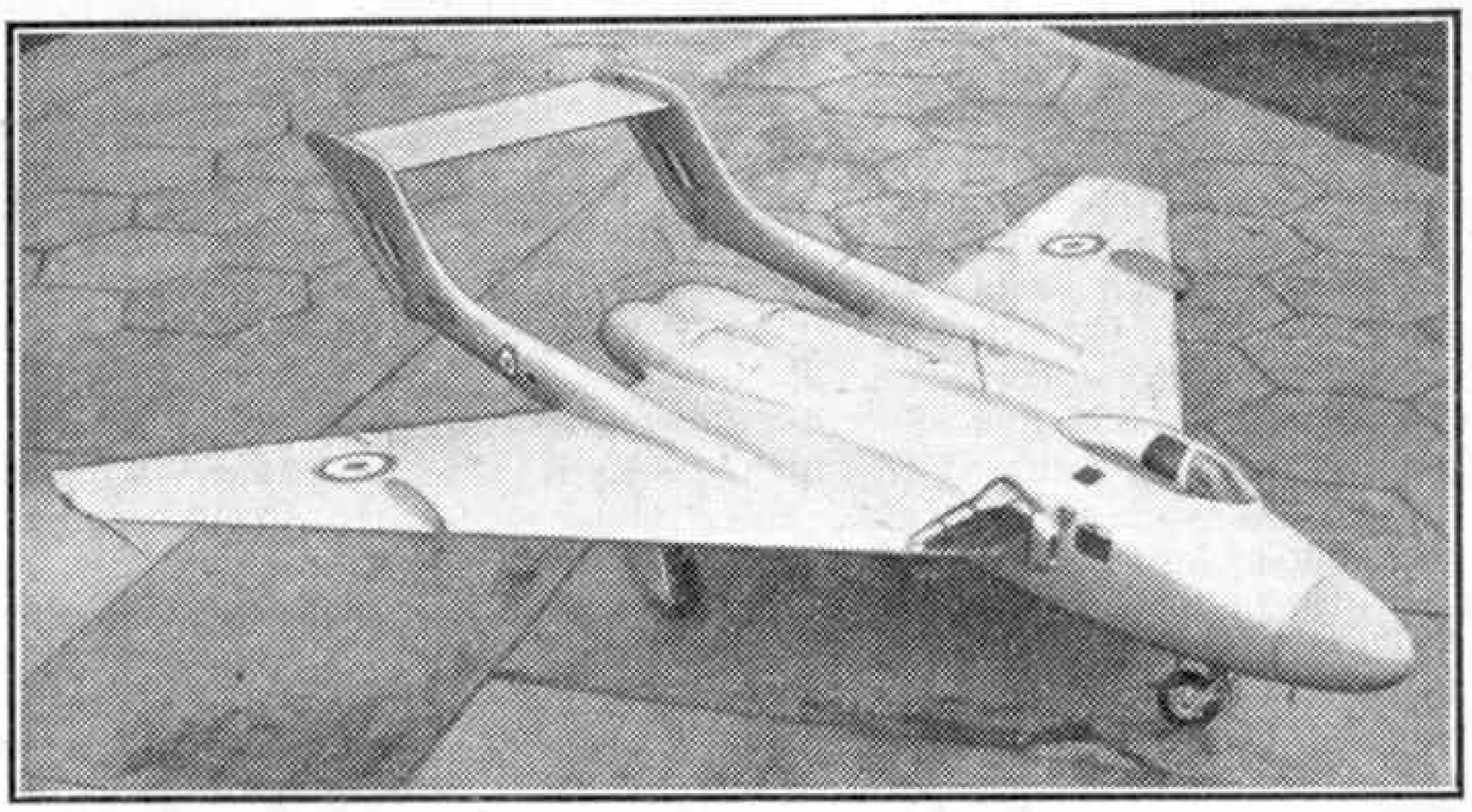
Air News

By John W. R. Taylor

First of the New

The de Havilland 110, illustrated on this page, is the first of a new class of two-seat all-weather jet fighters being developed to protect the British Isles from attack by fast, high-flying atom-bombers. Its twin-boomed layout is similar to that of the earlier D.H. "Vampire" and "Venom," but it is an entirely new and larger design, and made its first flight on 26th September last, piloted by Group Capt. John Cunningham.

Few details of the equipment or performance of the D.H. 110 have been released yet; but the fact that it is powered by two Rolls-Royce "Avon" turbojets guarantees speed and rate-of-climb far in excess of those of any aircraft the R.A.F. has in service at present. In addition, it is known to carry the latest secret equipment for day and night navigation and combat.

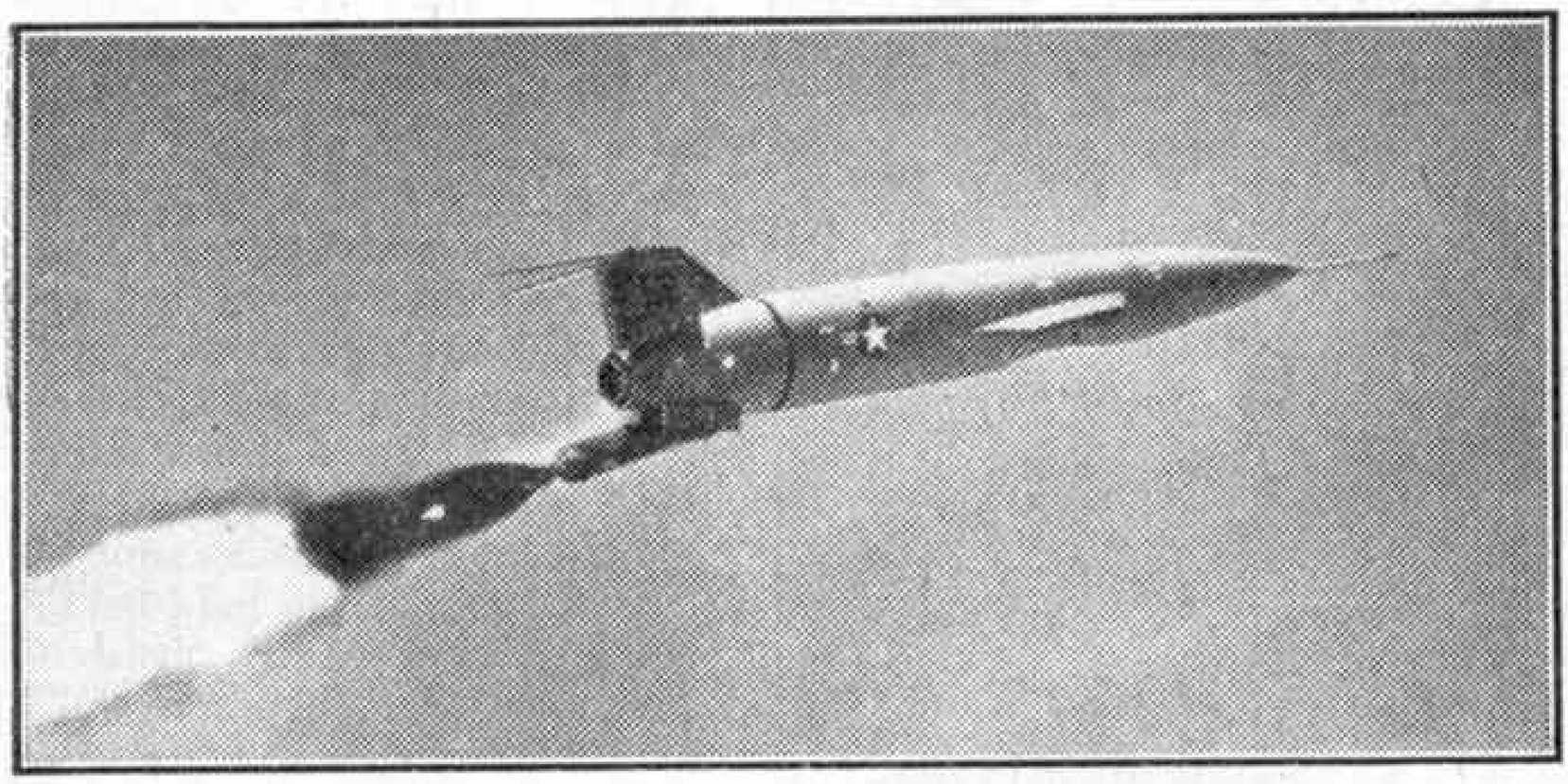


The de Havilland D.H.110 day and night jet fighter, which recently made its maiden flight. Photograph by courtesy of de Havilland Enterprise.

America's Robot Bombers

Proof of American progress in the development of "push-button" weapons is contained in the announcement that the U.S. Air Force has formed its first Pilotless Bomber Squadron (Light) at the U.S.A.F. Missile Test Centre, Cocoa, Florida.

The squadron is equipped initially with Martin B-61 "Matador" robot bombers, one of which is shown in flight in the lower illustration on this page. Like the German V.1 "Doodlebug," the "Matador" is a jet-propelled expendable weapon that blows up its target by diving into it. But it is of much more advanced design than its German predecessor, with its engine housed inside the fuselage, an auxiliary booster rocket under its tail for quick take-off, and a high degree of radio control whilst in flight. No details of its size, range, speed or method of control may be given at present.



"Matador" sweptwing pilotless bomber in flight. The booster rocket under the tail is jettisoned when its power has been exhausted after take-off. Photograph by courtesy of Glenn L. Martin Co., U.S.A.

B.O.A.C. Safety Record

The Guild of Air Pilots and Navigators have awarded their Cumberbatch Trophy to B.O.A.C.'s No. 3 Line, for its magnificent record of safe flying on the Corporation's post-war North Atlantic service, which was inaugurated 5½ years ago. The Trophy is awarded each year to the organisation or individual in the British Empire considered by the Guild to have made the greatest contribution to air safety.

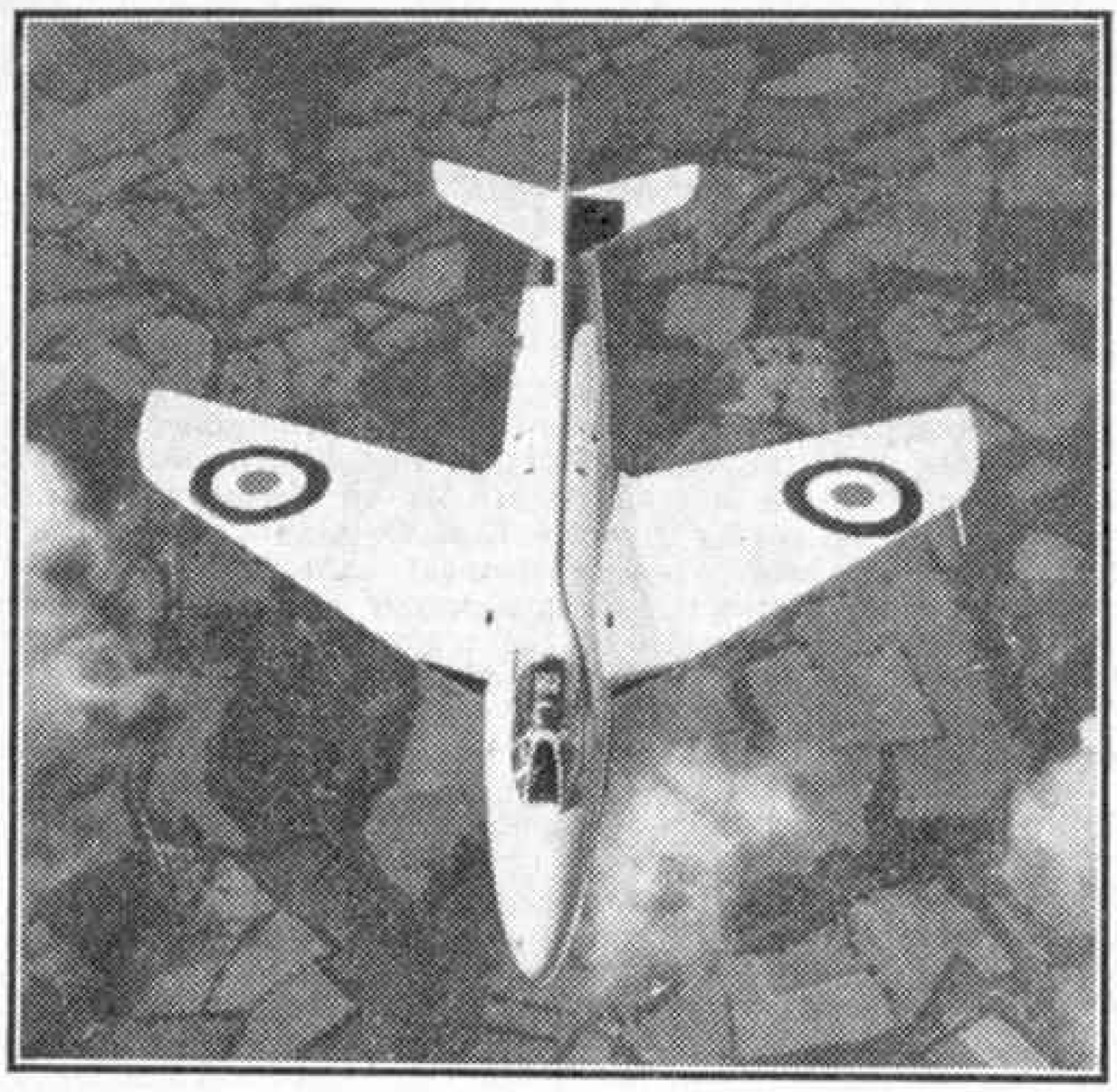
During its first four years of post-war service—the period covered by the award—No. 3 Line's aircraft crossed the Atlantic 3,850 times, completing 14 million route miles and 267 million accident-free passenger-miles. Lockheed "Constellations" were used for the first 3½ years, followed by the present Boeing "Stratocruisers," which were introduced in December 1949.

Helicopters Used in Korean Action

American Marines in Korea have used helicopters in combat for the first time, following earlier successful operation of these aircraft for transport, supply dropping and casualty evacuation. A dozen Sikorsky machines were used to transport a reinforced company of troops to positions on a steep mountain which would have taken two days to climb. They moved the troops, complete with ammunition and rations, in four hours, under the noses of enemy guns. One helicopter even laid a telephone cable to link forward positions with their headquarters.

The "Nomad"

One of the star attractions of this year's S.B.A.C. Exhibition was the new Napier "Nomad" compound engine, which promises to be the power unit of the future for long-range patrol-bombers and air liners.



First flight picture of the Hawker P.1067 jet fighter. Photograph by courtesy of Hawker Aircraft Ltd.

Nothing like the "Nomad" has ever been seen before. It is very large, but this is hardly surprising as it is really two engines in one. The front portion is a highly-supercharged 12-cylinder two-stroke piston engine, which drives the rear one of two contra-rotating propellers. The forward propeller is turned by a gas-turbine, which is itself driven by the exhaust from the piston engine. In this way, very little power is wasted, and the "Nomad's" fuel consumption ratio is better than that of any other engine in the world, ensuring long range for aircraft in which it is fitted.

The "Nomad" weighs 4,200 lb., is 10 ft. 6½ in. long and gives 3,000 h.p. for take-off, plus 320 lb. of jet thrust. It runs on either paraffin or diesel oil.

Rubber Air Lift

To avoid loss of life and property at the hands of the Vietminh rebels in Indo-China, the local airline S.I.T.A. is operating a regular rubber air lift between Saigon Airport and the more important rubber plantations, using Bristol "Freighters."

Transport of raw rubber by road or rail has been both slow and costly since the war began. Fortunately, most of the larger estates already had sizeable airfields, so it did not take long to get the air lift working. As distances are short, usually from 60 to 100 miles, it is not necessary to carry much fuel, and the "Freighters" have been able to take off regularly with six tons of rubber, returning with supplies, machinery and even lorries for use on the estates.

Another New Airship

The latest addition to the U.S. Navy's anti-submarine airship fleet is the Goodyear N.1, which, with a capacity of 875,000 cu. ft. and length of 324 ft., is the largest non-rigid "blimp" ever to fly. Everything possible has been done to ensure the comfort and efficiency of its 14-man crew during long patrols. The cabin, for example, has two decks, with bunks for off-duty members of the crew and a kitchen "upstairs," and the flight deck below. The two 800 h.p. Wright engines are mounted inside the car, so that they can be serviced easily during flight, and very comprehensive radio and radar submarine detection gear are carried.

Plastic 'Planes

Scientists at the Royal Aircraft Establishment have developed a new method of plastic construction for aircraft which may halve the cost of high speed fighters and missiles of the future. A delta wing, built to test the new material, was exhibited on the Ministry of Supply Stand at the S.B.A.C. Display at Farnborough, and left little doubt of the possibilities of the process.

Moulded to shape and reinforced at places where extra strength is needed, high strength plastic structures can not only be manufactured quickly and cheaply with simple tools, but can be polished to the high degree of smoothness required by very fast aircraft. A wing made of the new plastic could serve also as an integral fuel tank, needing no additional containers inside it. The insulating properties of the material enable radio aerials to be buried inside the structure, and its heat and sound insulating qualities are equally good.

"Fireflies" for Ethiopia and Siam

The Royal Thai Navy and Imperial Ethiopian Air Force have both taken delivery of initial batches of Fairey "Firefly" Mk. 1 aircraft, the type chosen to equip their fighter and reconnaissance squadrons.

"Fireflies" were chosen for Ethiopia's first fighter units because of their suitability for ground attack duties in the high altitudes and temperatures of that country. Like the Thai aircraft, they are ex-Royal Navy Mk.1 machines, of the type flown with such success from H.M.S. "*Triumph*" in Korean waters. All were completely reconditioned in Fairey's northern factory at Stockport before delivery, and are equipped to carry bombs, rockets or extra fuel tanks, as well as four 20 mm. guns.

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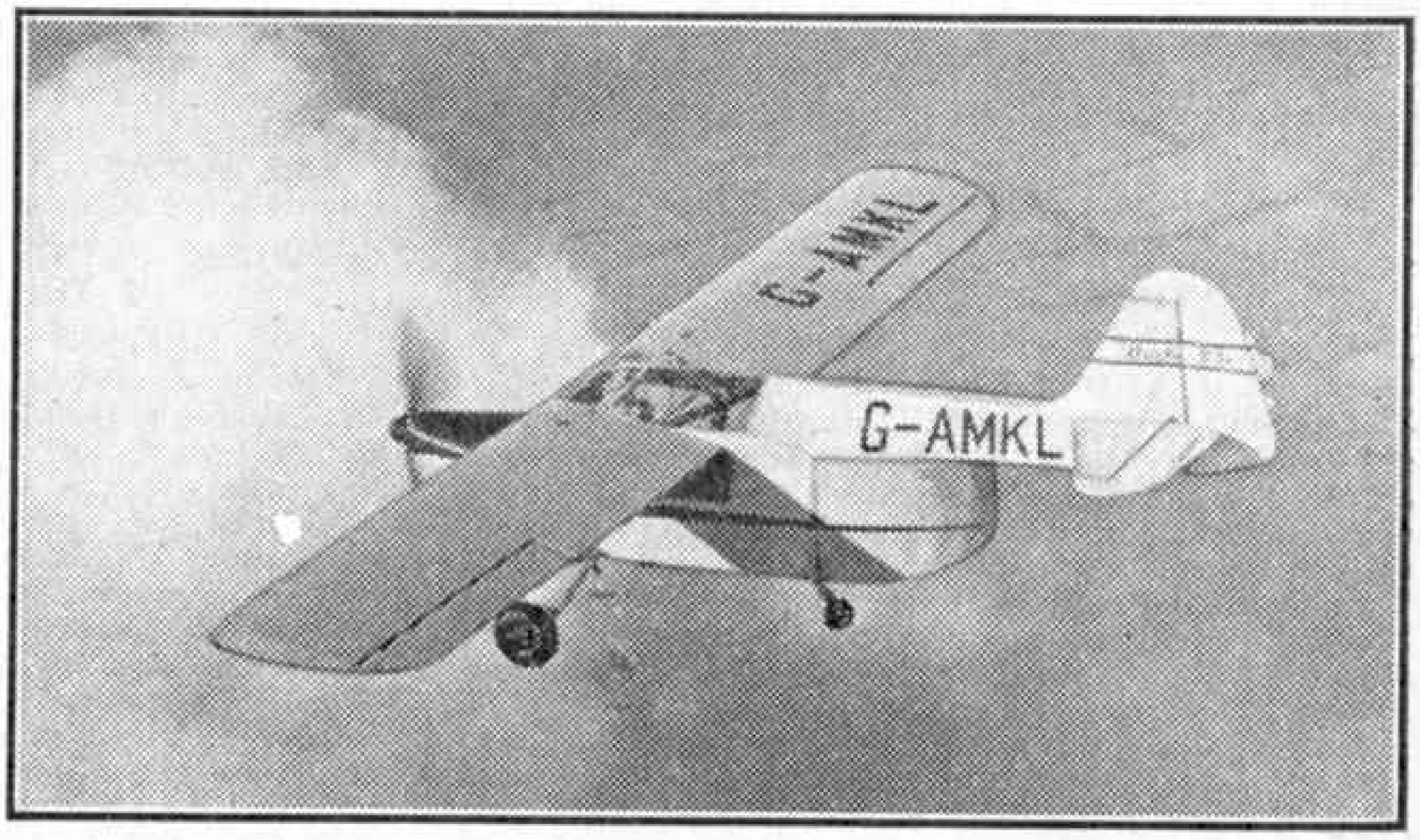
The Alaska-based 58th Strategic Weather Reconnaissance Squadron of the U.S. Air Force, equipped with B-29 "Superfortresses," has completed more than 500 flights over the North Pole.



The new Auster ambulance-freighter, which promises to be one of the most useful small 'planes ever built. (See article on page 548). Photograph by courtesy of Auster Aircraft Ltd.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"THE BULLEID PACIFICS OF THE SOUTHERN REGION"

By Cecil J. Allen and S. C. Townroe
(Ian Allan Ltd. 10/6)

Many novelties were introduced by the designer, Mr. O. V. S. Bulleid, of the former Southern Railway's "Merchant Navy," "West Country" and "Battle of Britain" 4-6-2s, and the authors of this book have spared no effort to do justice to the enterprise and originality of his designs. They give full descriptions of the "Merchant Navy" class, with due attention to the special features of the design, including the cab arrangements, and of the "Lightweight" 4-6-2s.

Performance is then dealt with. The work of the engines on the road makes interesting reading, especially when the feats of the Southern engines in the locomotive interchange trials of 1948 are under consideration. An examination follows of locomotive operating problems, with special reference to the Southern "Pacifics." Cab diagrams, with outline drawings, tables of dimensions and lists of names and numbers bring the account to a close.

The book is well illustrated and, for one that deals with a series of engines virtually identical in appearance, there is a pleasing variety in the photographs reproduced.

"BOY'S BOOK OF HOBBIES"

Edited by Carlton Wallace
(Evans. 12/6)

In this thick volume of 300 pages there must be at least one hobby to suit any boy. The hobbies dealt with are arranged in sections, beginning with constructional hobbies and then turning to scientific pursuits, natural history and collecting, and the keeping of pets.

The constructional hobbies include the building of model aeroplanes, ships and motor cars, with working in wood and metal generally and a section on the use of plastics. Experiments in chemistry, electricity and radio, and photography introduce the scientific hobbies, which include astronomy and microscopy.

How to study wild birds and their habits, one of the most satisfying of all outdoor pursuits, gives us a good start in the natural history section, which covers fishing as well as the collecting of plants and flowers, butterflies and moths, and stamps. Finally come pets. Here all animal lovers will find something to interest them.

There is a very good index and the illustrations include both reproductions of photographs and useful line drawings.

"THE CARAVAN COMES HOME"

By Lucy W. Bellhouse

"TIMMY IN THE COUNTRY"

By Rosalind Vallance
(Harrap. 4/6 each)

Here are two delightful little stories for the youngest readers of the "*M.M.*" The first begins "Once upon a time . . . " and the result is as good as stories opening in this way usually are. In it five children set out to make their way home by caravan from Tara, a small island in the far north west corner of Scotland, and encounter many remarkable people of all kinds on the long trail through Scotland and England that leads them home.

Timmy, who gives his name to the second of these books, was a great friend of Roger, who thought a piece of waste ground on which he played was just like the country! Timmy knew better and tried to explain, but to prove his story true they had to travel by train into the real country, and there many wonderful things happened to them.

"THE LONDON TRAMCAR, 1861-1951"

By R. W. Kidner (Oakwood Press. 5/6)

Mr. Kidner's book gives a brief history of the tramcars that have operated in the London area over the past 90 years. A surprisingly large amount of information is packed into its 46 pages, which will give the reader a comprehensive picture of the many and diverse types of tramcar that have traversed London's streets. Fleet numbers are given, together with main details of the trams forming the rolling stock of the different undertakings operating before 1933, and the book ends with a complete list of the new numbers assigned when the vehicles passed to the control of the London Passenger Transport Board. This occurred in 1933, and at that time there were over 2,000 tramcars in operation in the London area.

There are many illustrations, but it is surprising to find that not one shows a tram in London Transport livery, and that there are no illustrations whatever of the HR2 type and only one very small picture appears of the E3 class, types that have been among the mainstays of the London services for a number of years past and will be running right up to the end.

Copies of the booklet can be obtained from the Oakwood Press, Tanglewood, South Godstone, Surrey, price 5/6 net. Postage is 3d. extra.

"MODERN MOTORCYCLES"

By Bernal Osborne

"MODERN MOTOR BOATS AND YACHTS"

By Norman H. Loveless
(Temple Press. 8/6 each)

The interest of boys in motor cycles will never cease, and next to seeing or riding them nothing can please them more than learning all about them. The first of these two volumes of the Boys' "Power and Speed" Library explains how the motor cycle developed into its present form, and what happens inside a modern motor cycle factory. Then the author takes his readers on the open road and to local grass tracks, trials and hill climbs, and to the great international meetings where riders of all nations struggle for supremacy.

Sailing yachts and motor cruisers, the light coastal forces of the Royal Navy and the life-boats of the R.N.L.I. are the subjects of the second of these "Power and Speed" volumes. Mr. Loveless starts with the making of a boat. He then visits in turn inland racing waters and the sea, and the reader joins him in a cruise overseas, plotting the course and taking his turn at the wheel.

Each volume is fully illustrated, and has a vivid coloured frontispiece.

"FOWLER, STANIER AND IVATT LOCOMOTIVES OF THE L.M.S., 1923-1950"

By C. Langley Aldrich (7/6)

This is a revised version of the first edition of Mr. Aldrich's booklet, which was reviewed in the "*M.M.*" for October 1947. As Sir Henry Fowler did not take over as Chief Mechanical Engineer until 1925 the date given in the title may be slightly misleading. The book is not a mere name and number register, however; it presents a summary of L.M.S. locomotive history and subsequent developments up to the end of December 1950, including livery details.

There are a large number of illustrations, but these are mostly reproductions of familiar official photographs, excellent in themselves, that have appeared often in various railway publications.

Copies of the booklet are obtainable from the author at Eastcote, 70, Chapel Road, Brightlingsea, Essex, price 7/10 including postage.

Engineering Notes

NOT A SAMSON!

The workman seen in the illustration at the head of this page is not performing a special feat of strength. He is engaged on bridge construction in Canada, and he can carry the large girder shown quite easily, because it is made of aluminium alloy and weighs only about a third as much as a steel one of the same size.

The girder is now part of the Arvida Bridge, in Canada, the longest aluminium alloy bridge in the world. An article describing and illustrating this will appear in an early issue of the "*M.M.*"

THE HOLME MOSS TELEVISION MAST

The Holme Moss television mast towers to a height of 750 ft., and is more massive than that at Sutton Coldfield. It is also more heavily stayed to withstand severe conditions. Its total weight is 140 tons, and its base rests on a steel ball 2 in. in diameter in a socket. This acts as a pivot so that the mast can sway slightly in strong winds. The greatest thrust on the base in the most severe conditions is 350 tons.

The section of the mast is triangular up to a height of 610 ft., each face measuring 9 ft. across, and for the next 100 ft. upward it is circular. Above is a short top mast that is square in section. This supports the television aerial.

The wire ropes of the four sets of stays holding the mast in position have a breaking stress of 120 tons per square inch.

LINING WATER MAINS

A demonstration was given recently of a machine for coating the inner surfaces of water mains with cement mortar. This actually travels through the pipe to be lined. Cement mortar from its hopper is fed by a worm to a revolving head, which throws it off at high speed on to the inner surface of the pipe. Arms with trowel heads immediately behind rotate at a lower speed and give the mortar a smooth finish.

One man can easily pick up a large metal girder, and walk briskly away with it, if the metal is an aluminium alloy. Photograph by courtesy of the Aluminum Company of Canada Ltd.

The thickness applied can vary from $\frac{3}{16}$ in. to $\frac{1}{2}$ in., and the machine works through a pipe at a speed of from 1 ft. to 3 ft. a minute, according to the thickness of lining desired.

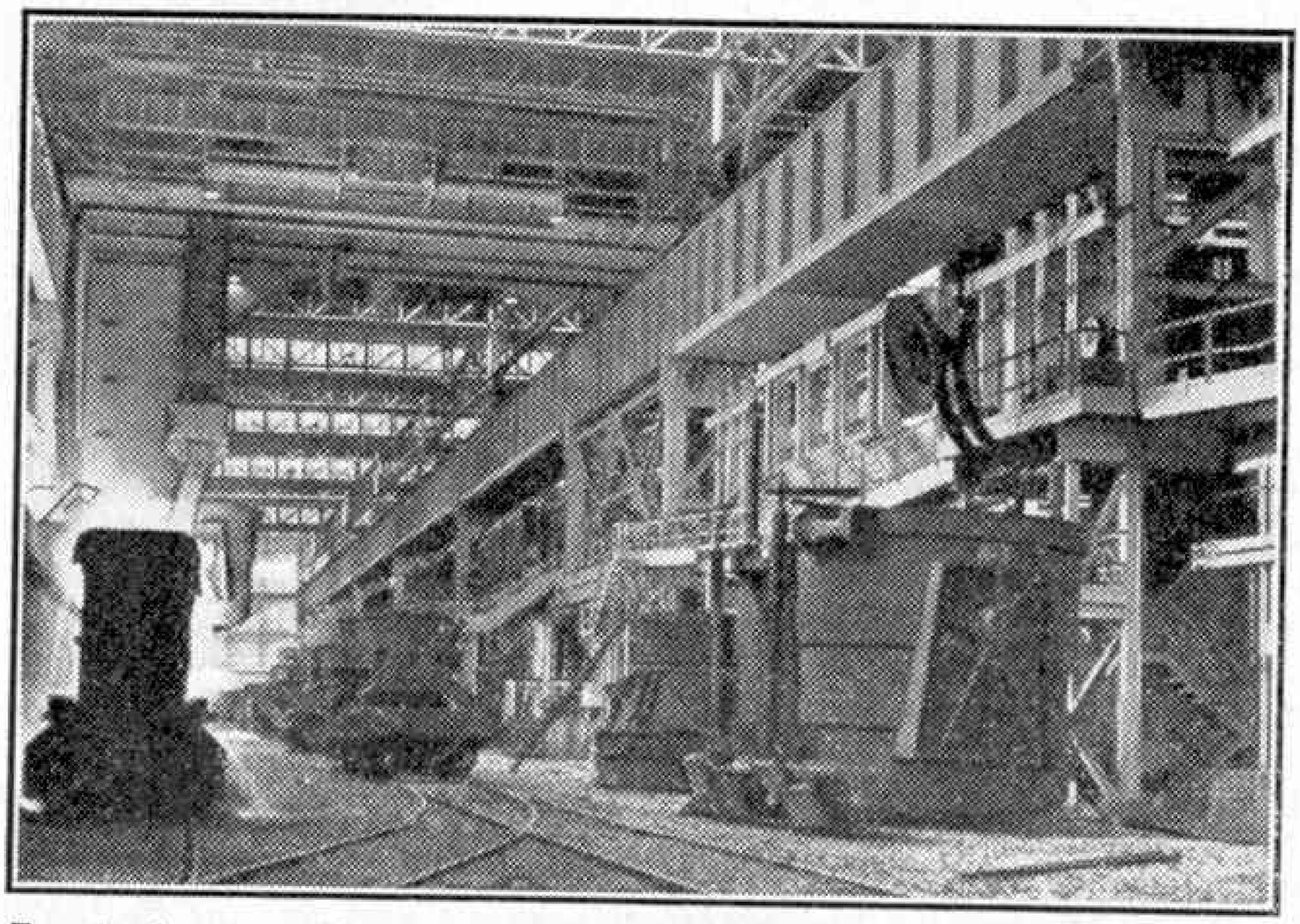
A GIANT PUMP NOW AT WORK

Last June a further stage was reached in the progress of the Grand Coulee Dam scheme, in the Pacific North West of the United States, when the first 65,000 h.p. pump was brought into operation for transferring water from the lake behind the Dam to the equalising reservoir. From this it will flow through canals to make a million acres of thirsty land fruitful.

When the Dam was built a cavity was blasted out of the granite cliff at its west end, and to-day this is the site of the pump house. Twelve tunnels over 400 ft. long and 7 ft. across were bored upward through the rock wall, and up these the water of the lake is pumped to steel discharge pipes that deliver it to a feeder canal. This carries it to the reservoir for distribution through other canals.

Five further pumps will be at work by autumn of next year, and six more will follow. When all twelve are in operation they will require five times the amount of power used by the next largest pumping unit at work in the United States.

The great generators of the Grand Coulee Dam began producing current in March 1941, and since that time they have yielded a total of about 59,000 million kilowatt-hours of electric energy.



Teeming in progress from a 200-ton ladle into ingot moulds in the Abbey Works Melting Shop. These great new steelworks in South Wales are described and illustrated on page 539 of this issue.

The Tal-y-Llyn Railway

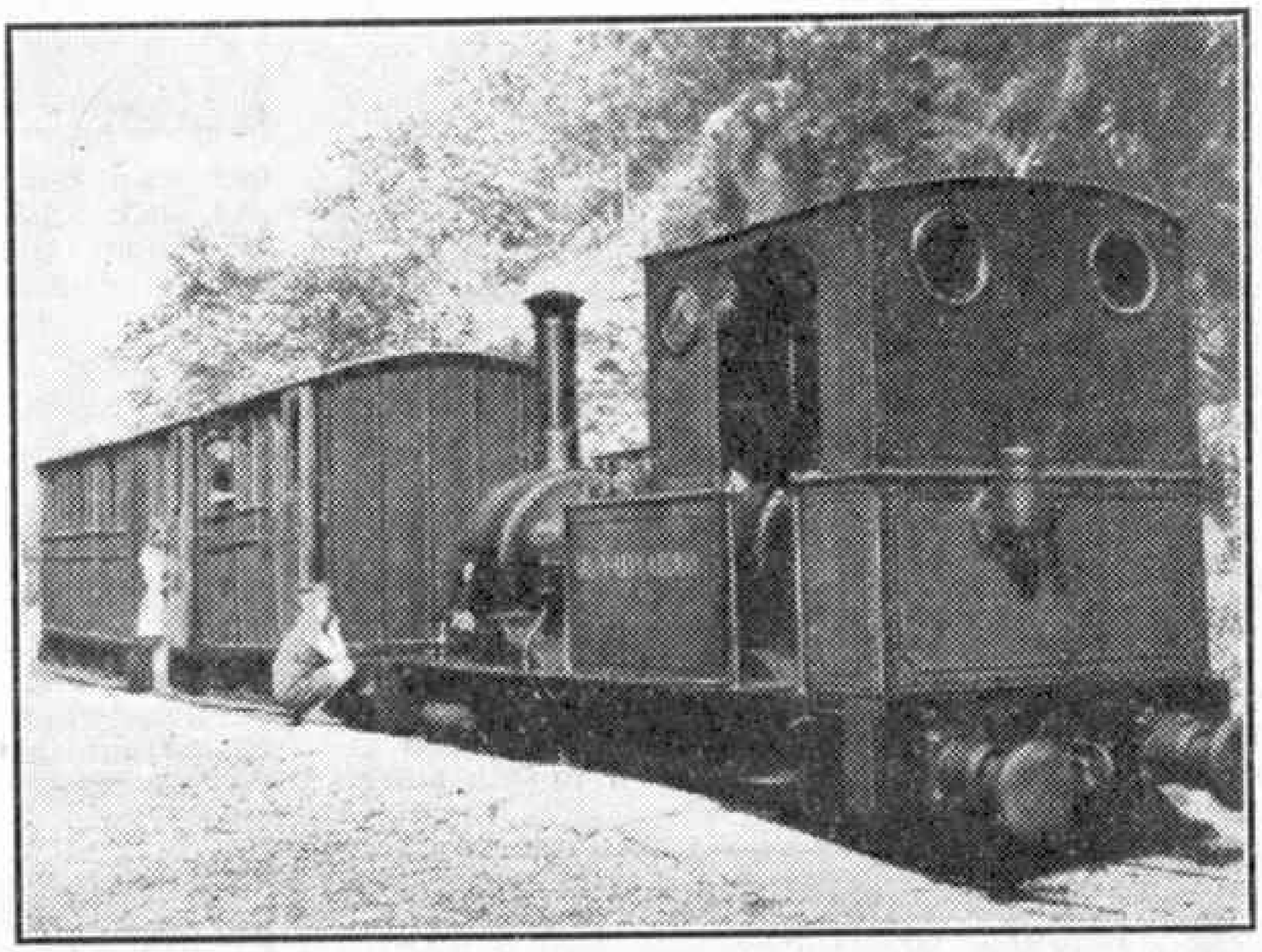
By E. Emrys Jones

NOWADAYS it is not an easy matter to write about a privately-owned railway. In the lovely county of Merioneth in North Wales there is such a railway, but just to describe it as a privately-owned railway and leave it at that would be a crime. Let me hasten to add that it is also a fascinating, useful and very well organised affair. It is now the oldest surviving steam-worked passenger-carrying narrow gauge line in the world. It has a character about it, and the owners are to be congratulated on their enterprise in keeping the railway alive, ensuring that it runs well, and yet maintaining that atmosphere which could belong only to the Tal-y-Llyn.

The railway is laid to the gauge of 2 ft. 3 in. and takes passengers from the seaside resort of Towyn to Abergynolwyn, a typical Welsh village near Tal-y-Llyn Lake. The latter must certainly rank as one of the loveliest stretches of water in Britain, situated as it is in a hollow and surrounded by high steep-sided hills. Cader Idris looks down on Tal-y-Llyn. Anglers find nice plump fish just waiting to be hooked there, and cows from the lakeside farms cool themselves in the clear water in summer.

It is at once obvious why visitors make use of this railway. From Towyn to Abergynolwyn is seven miles, but what it really amounts to is that people enjoying a holiday by the sea at Towyn can go right into the heart of the mountains and sample rural Wales proper. They can also fish in the lake, or simply picnic in perfect sylvan surroundings. The mountains are not bare, but are cultivated up to the high levels, and sheep graze on the green higher slopes. Incidentally the scenery along the route is of well-wooded country surrounded by 1,000-ft. hills. It is essentially a farming country, with slate quarrying on the hillside. Many campers are to be found in this area; for them the train is a boon and a blessing.

There are several stopping points on the way. It is 2½ miles from Towyn to Rhyd-yr-onen station; then come Brynglas and Dolgoch stations and, finally, Abergynolwyn. There the station is at a height of a little over 200 ft., whereas Towyn station is practically at sea level. So that you can see that the gradient is not too severe, 200 ft. in a little over six miles. The only special engineering item on the railway is the Dolgoch Viaduct. It is three-spanned and was erected in 1865, the cost being £5,000. At Dolgoch is a very fine waterfall, which is a feature of the lovely countryside here.



A Tal-y-Llyn train at Abergynolwyn. The boy on the platform is intently watching the engine being coupled up.

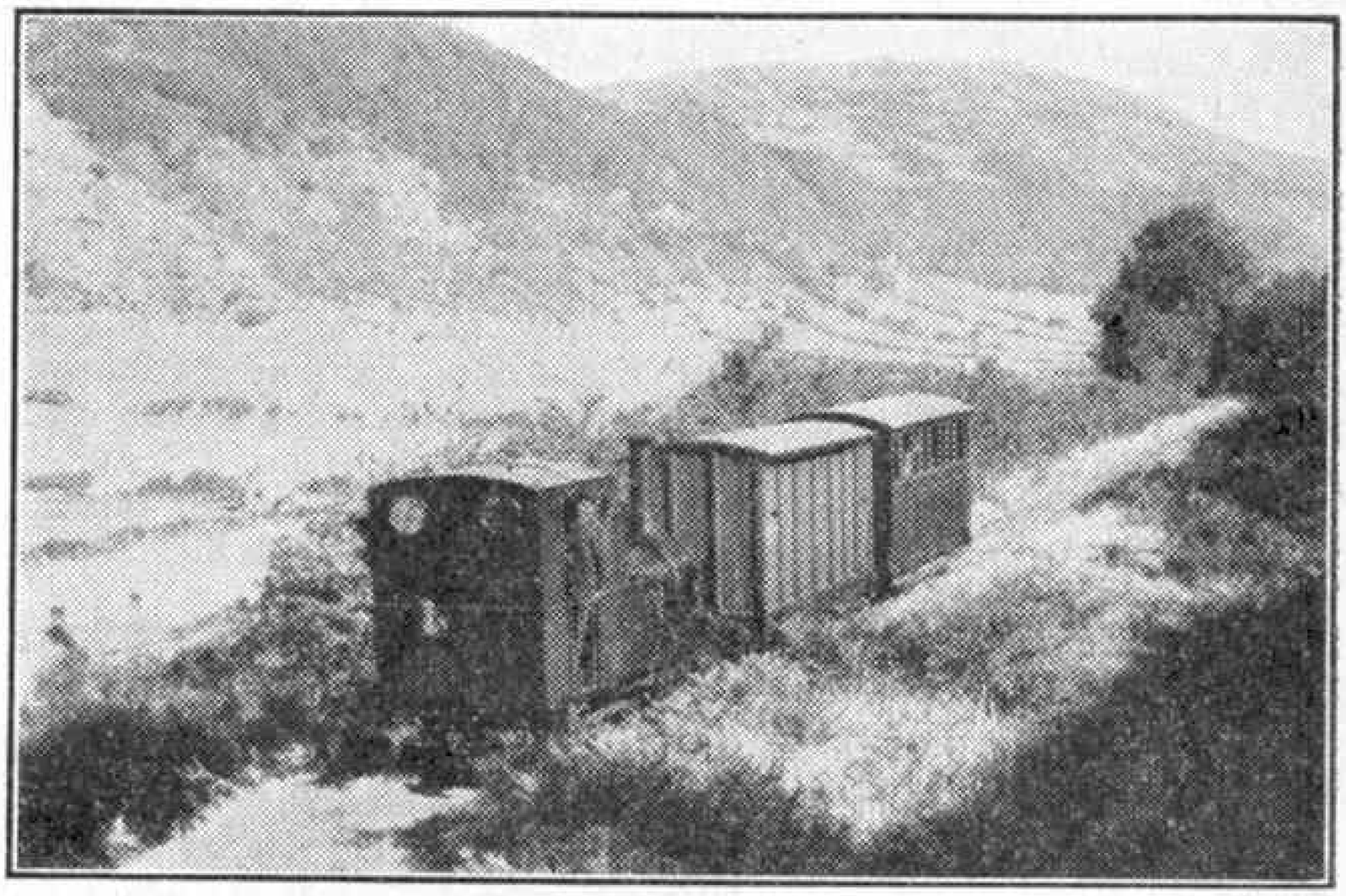
Last year, on the death of Sir Haydn Jones, the former owner and manager of the line, it looked as though the railway would have to close down. Fortunately, however, it is now in the hands of the Tal-y-Llyn Railway Preservation Society, which was formed to ensure the survival of the line, its locomotives and stock, not merely as museum exhibits, but as an actual working concern. Their aim has been to make the line representative of the narrow gauge era at its best. As a result of their efforts it was possible to re-open the railway last Whitsun for the summer season, and to maintain a passenger train service of two trains each way five days a week from 4th June

to the end of September, when the usual autumn closing took effect.

Special attention was devoted to the track and a considerable amount of re-laying was carried out by the regular staff and by volunteers interested in the project. Many rail lengths were in need of replacement and a large number of sleepers were rotten, while in places the road bed needed attention to its drainage. Bad weather throughout last winter and later slowed down the work, and in addition caused more than the usual deterioration after the end of the previous running season. In making the necessary repairs good use was made of track material from the former Corris Railway. The Corris rails are of a slightly different section from those of the old Tal-y-Llyn, and therefore have to be used in a continuous run, and not for random replacements.

Of the two original locomotives, bearing the names of "*Tal-y-Llyn*," and "*Dolgoch*" respectively, only the latter was in anything like a workable condition when the Society took over. Welcome additions to the motive power were the two locomotives that formerly did duty on the Corris Railway. These were presented by members of the Society. They became Tal-y-Llyn Nos. 3 and 4, and it was decided to name them "*Sir Haydn*" and "*Edward Thomas*" respectively.

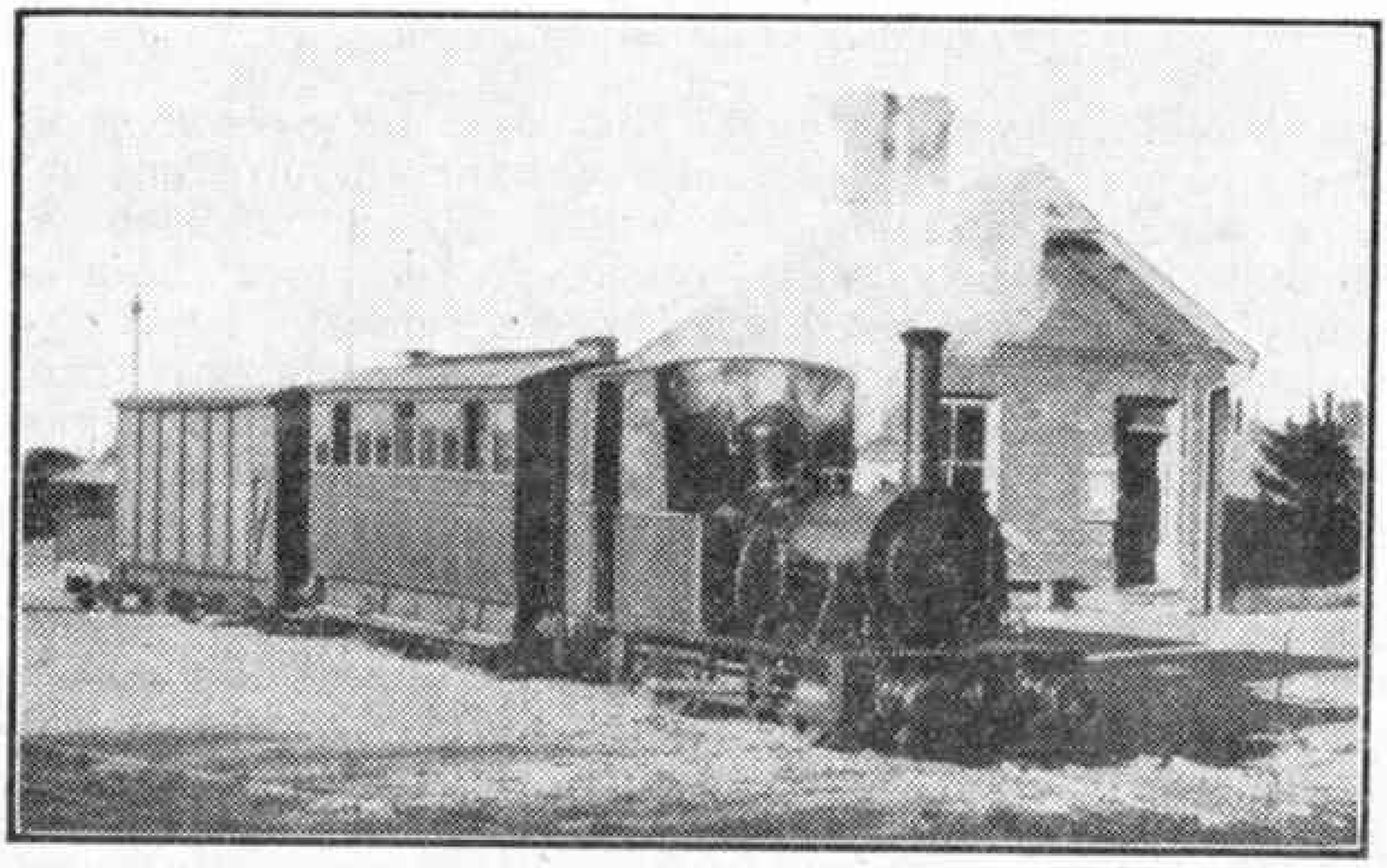
The passenger coaches are relics of the 1860's, yet they work well, although they are not lighted or heated. Automatic brakes are not fitted; the couplings are hook and chain, with side buffers. The three compartments in each coach seat three or four passengers per side. An ex-Corris brake van was presented to the Society with the Corris engines mentioned previously.



The locomotive "Dolgoch" and train in characteristic surroundings. The illustrations on this page are by courtesy of the Tal-y-Llyn Railway Preservation Society.

Visitors staying at Towyn, Barmouth or Fairbourne in the summer should certainly not miss a trip on this railway. It is very much worth while for the views alone, for the grandeur of Tal-y-Llyn Lake and Cader Idris is really awe inspiring. This railway makes easy access to these wonderful places possible and the ascent of Cader Idris can be made from the very shores of Tal-y-Llyn Lake.

The line is of real service to all who wish to explore beautiful Merionethshire, and how much it is appreciated is shown by the fact that more than 15,500 passengers travelled over it during the season that ended in September last. This was probably an all-time record.



"Dolgoch," at Towyn, with typical specimens of Tal-y-Llyn rolling stock.

The World's Greatest Air Show

By John W. R. Taylor

WHEN I first suggested writing an article on this year's S.B.A.C. Flying Display at Farnborough for the "*M.M.*," the Editor replied: "Fine—but don't make it just a catalogue of aeroplanes. Try to find a new angle on the show."

It was a difficult assignment, because the Display is described annually in thousands of journals, from Tyneside to Timbuctoo and beyond. But my luck was in, for one of the first people I met at Farnborough asked me if I would like to take a ride in his aeroplane during its demonstration flight. My problem was solved. I was going to see the show from a completely new angle—from above!

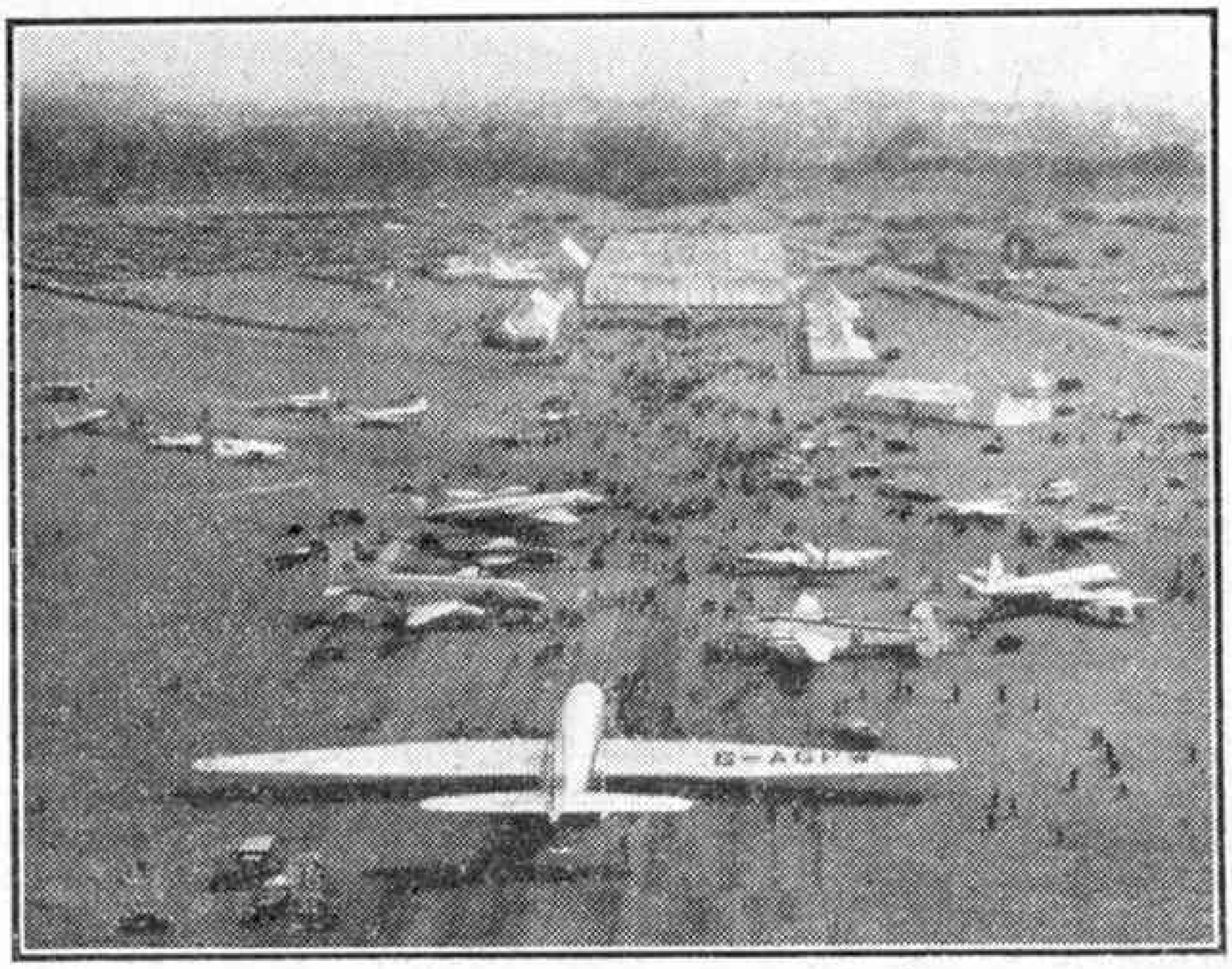
It was only later, when I watched test pilots doing incredible aerobatics in our latest jets, that I realised just how lucky I was. In contrast with their nerve-wracking evolutions, I was to fly in the little Short "Sealand" amphibian, judged by most spectators to be the 'plane they would most like to own and which would certainly not do anything too frightening while I was inside it.

Seated in its roomy five-seat cabin, waiting near the long runway for our turn to take off, I recalled my wonderful journey to Madeira and back last year in one of its bigger brothers, a "Hythe" flying boat of Aquila Airways, and reflected sadly that this year the "Sealand" was the only flying boat in the show.

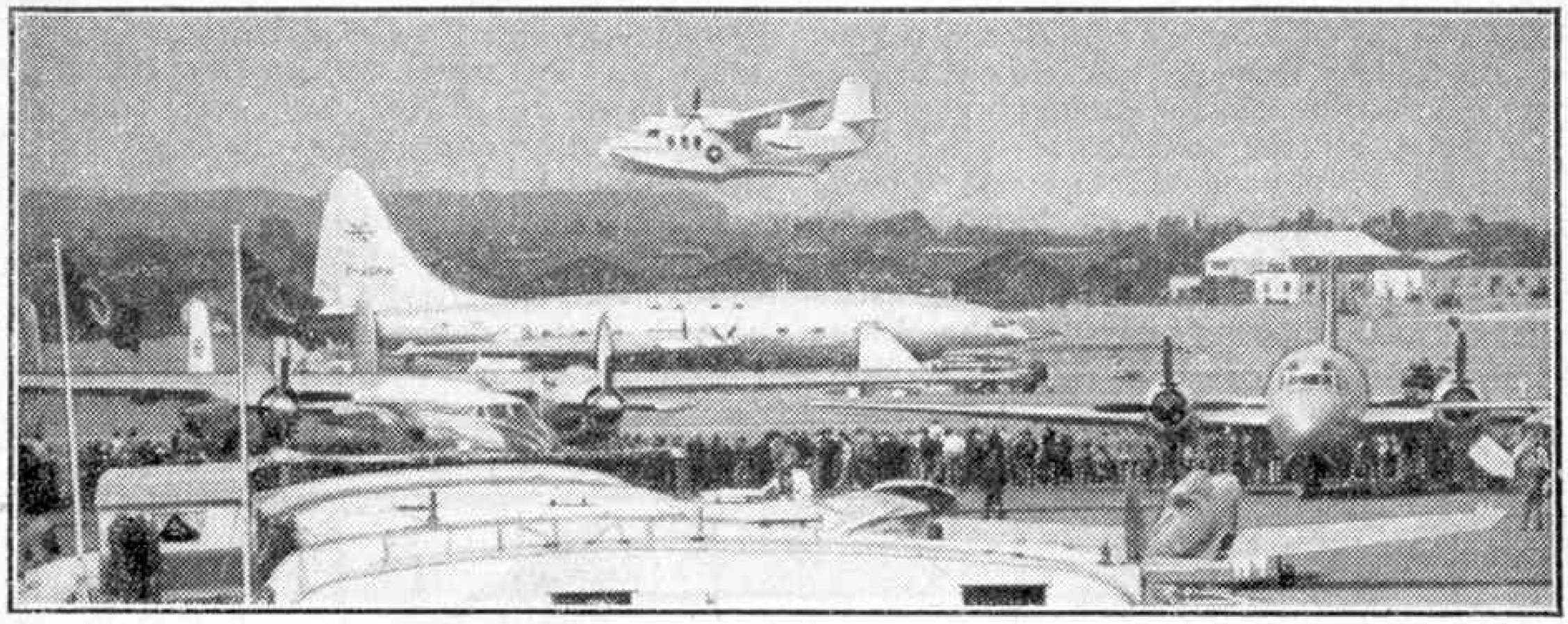
I was not left to my quiet dreaming for long. Suddenly there was a crescendo of noise behind us as Bill Pegg, the famous "Brabazon" pilot, started up the engines of his "Proteus-Lincoln"; while in front of us the beautiful "Viscount" propjet air liner began to sweep majestically down the runway and into the air, to open the flying programme. It was followed in quick succession by the other six aircraft of the heavy circus, including a five-engined "Lincoln" flying test bed, carrying in its bulbous nose one of the revolutionary new Napier "Nomad" compound engines, a description of which is given in this month's "*Air News*."

As each of the "heavies" completed its wide circuit of the aerodrome and then flew low over the runway in front of the crowds, Short's test pilot Jock Eassie started the two "Gipsy Queen" engines of our "Sealand," which began throbbing with life. Through the big cabin windows we could see on one side the "Dove" and "Heron" that were to precede us in the fly-past, also with their motors running, and on the other side a "Dragonfly" helicopter "rescuing" two men from a rubber dinghy on the runway.

We began to feel excited; but there were 11 more machines to take off before our turn came. We could not see everything that was happening, as even the "Sealand" is not fitted with a sunshine roof. But we caught glimpses of the little Auster ambulance-freighter being put through its paces by Ranald Porteous. It was one of the last-minute surprises of the show and looked rather like a minute version of the huge Blackburn "Universal Freighter." But in the air it seemed as



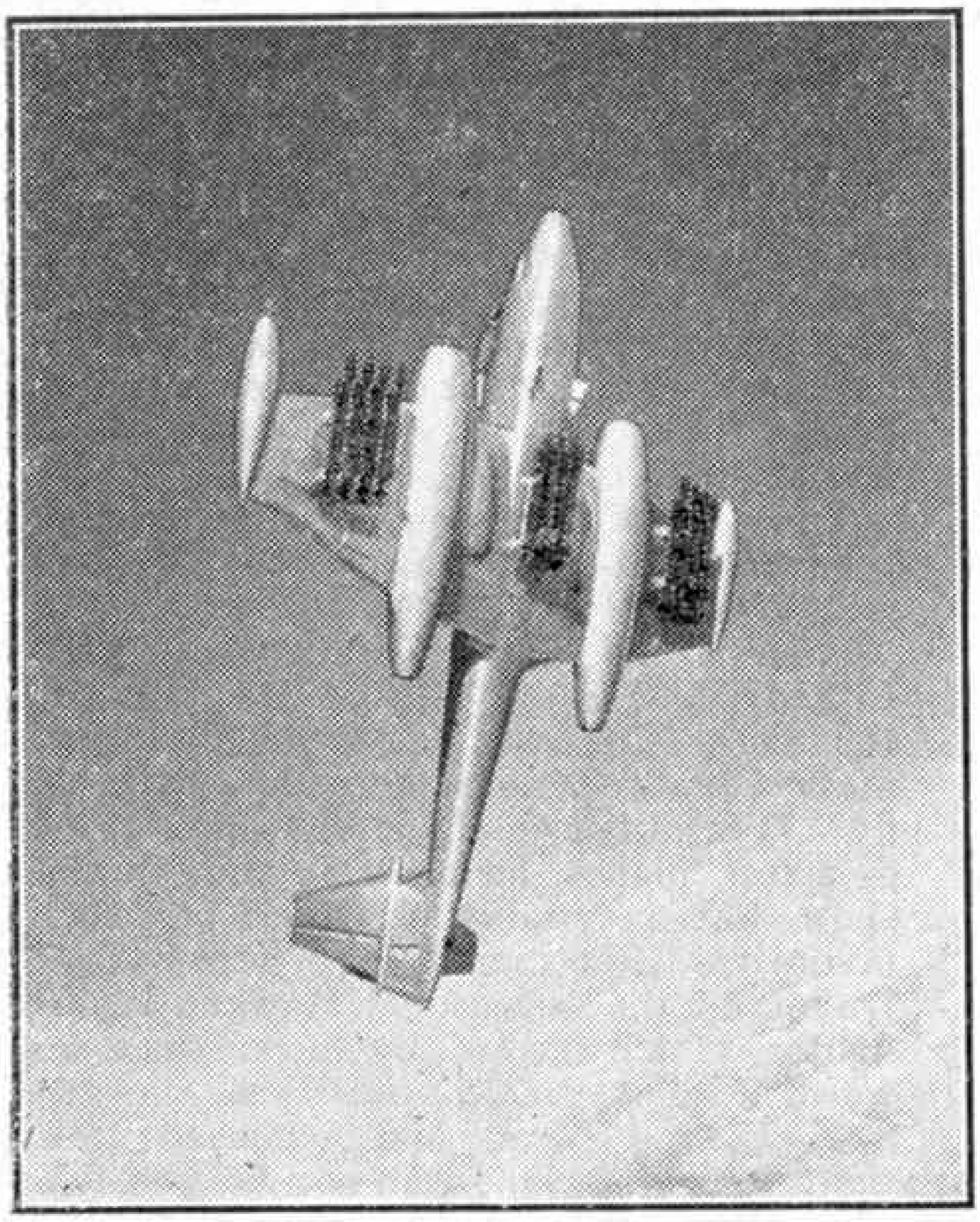
Aerial view of the 1951 S.B.A.C. Display at Farnborough. The Bristol "Brabazon," the world's biggest air liner, is in the foreground. Photograph by courtesy of Air Survey Co. Ltd.



The Short "Sealand" amphibian climbing with one engine stopped. Photograph by courtesy of "Flight."

spritely as any other Auster, combining first-class performance with undoubted usefulness for a wide variety of jobs. In fact, there seems no reason why it should not prove as versatile as the popular Bristol "Freighter," on a smaller scale, as it can operate from very small fields.

While it was performing, R. G. Wheldon had been climbing to 5,000 ft. in the R.A.F.'s new Percival "Provost" trainer.



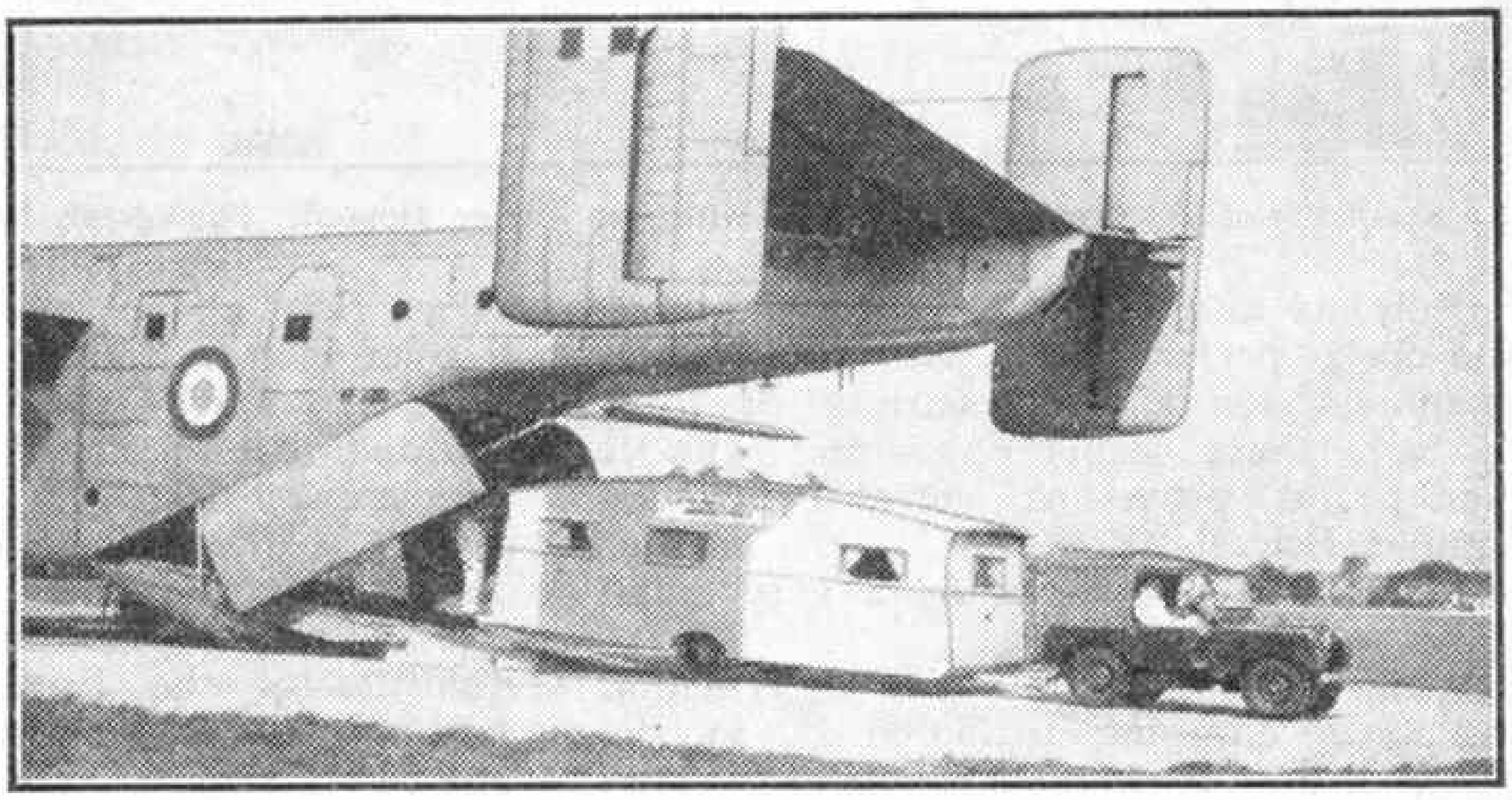
Zurakowski's P.V. "Meteor," carrying 24 rockets and wing-tip fuel tanks, shooting skyward in a vertical climb. Photograph by courtesy of Gloster Aircraft Co. Ltd.

When right above the airfield, he snapped it over into a spin. "One . . . two . . . three . . . four"—the commentator slowly counted each turn as the "Provost" corkscrewed down. " . . . five . . .six . . . seven . . ." Still it continued to spin, only 2,000 ft. up now. The crowd which had been noisily extolling the slow-flying qualities of the Prestwick "Pioneer" a few seconds earlier was suddenly quiet, and the silence was broken only by the quiet background purr of idling engines and the voice of the commentator, now somewhat anxiously counting "ten . . . eleven . . . twelve . . . thirteen." Just as it seemed that nothing could prevent the "Provost" from spinning right into the ground, Wheldon opened up its "Leonides" engine with a roar, pulled effortlessly out of the spin and raced low over the airfield in a steep bank. Even inside the "Sealand" we thought we could hear the simultaneous gasp of relief from thousands of onlookers!

Next on the programme was the medium circus, consisting of a "Sapphire-Canberra," "Wyvern," "Firefly 7," "Sea Prince," "Dove," "Heron" . . . and us. It was interesting to watch the different take-off techniques of the other aircraft as we taxied towards the end of the runway. The "Dove," for example, became airborne after quite a short run; its pilot at once retracted the undercarriage and flew low over the runway, gathering speed before climbing away. The fixed undercarriage "Heron," on the other hand, demonstrated its quick take-off ability by going into a steep climb the moment its wheels left the ground.

When it was well clear, Jock Eassie

released the "Sealand's" brakes, opened up the "Gipsy Queens," and almost before we realised it we were climbing round the edge of the aerodrome after the "Heron." Below on our left was spread out the whole panorama of "Farnborough 1951," a never-to-be-forgotten sight in the soft September sunlight. Facing each other from opposite sides of the main runway were the world's biggest air liner, the "Brabazon," and what must surely be one of the world's biggest tents, containing the S.B.A.C. Static Exhibition of engines, models and the ten thousand and one components that go to make up a a modern aeroplane. Beside the tent was just one of many car parks, packed with row after row of cars; and swarming round everything, everywhere, the vast sea of men, women and children who had journeyed miles and paid their shillings to see the world's greatest air show.



The Blackburn "Universal Freighter" arrived at Farnborough carrying a "Land Rover" and this large caravan, which was used as the company's headquarters during the show. Photograph by courtesy of Blackburn and General Aircraft Ltd.

Away on the far side of the aerodrome were the buildings of the Royal Aircraft Establishment, including the great balloon shed which once housed Britain's first military airships, and the workshops and hangars from which have come so many of the great inventions that have helped to ensure British leadership in the air for nearly 40 years. In front of the hangars we could just distinguish "Cody's Tree," to which the great Anglo-American pioneer, Col. S. F. Cody, is said to have tethered the aeroplane in which, in 1908, he became the first man to fly from British soil. How strange his box-kite biplane would have looked at Farnborough this year beside the faster-than-sound fighters and gleaming, swept-wing atom-bombers clustered near that gnarled old tree, waiting their turn to take the air.

Soon the airfield was behind us, and Jock Eassie put the "Sealand" in a steep but gentle bank, seeming almost to scrape the tree-tops with the tip of its port wing as he swung the aircraft's nose round to line up with the end of the runway. And as he did so, we watched our port propeller gradually slow down and finally stop, for we were to demonstrate the "Sealand's" fine turn of speed, controllability and rate-of-climb on just one engine.

In a moment we were over the aerodrome again, racing down the runway at a height of about 20 ft. Tens of thousands of faces zipped past our windows and we could almost hear the clicks of hundreds of cameras as, far quicker than I can describe it, we were past the car park, the great exhibition tent, the President's tent, Press tent and aircraft park, and climbing up and up in a steep bank, first to starboard, then to port, still on one engine. We had one more perfect view of the show under the "Sealand's" high wing as we did our landing circuit, then the screech of brakes told us we were down to a feather-light landing.

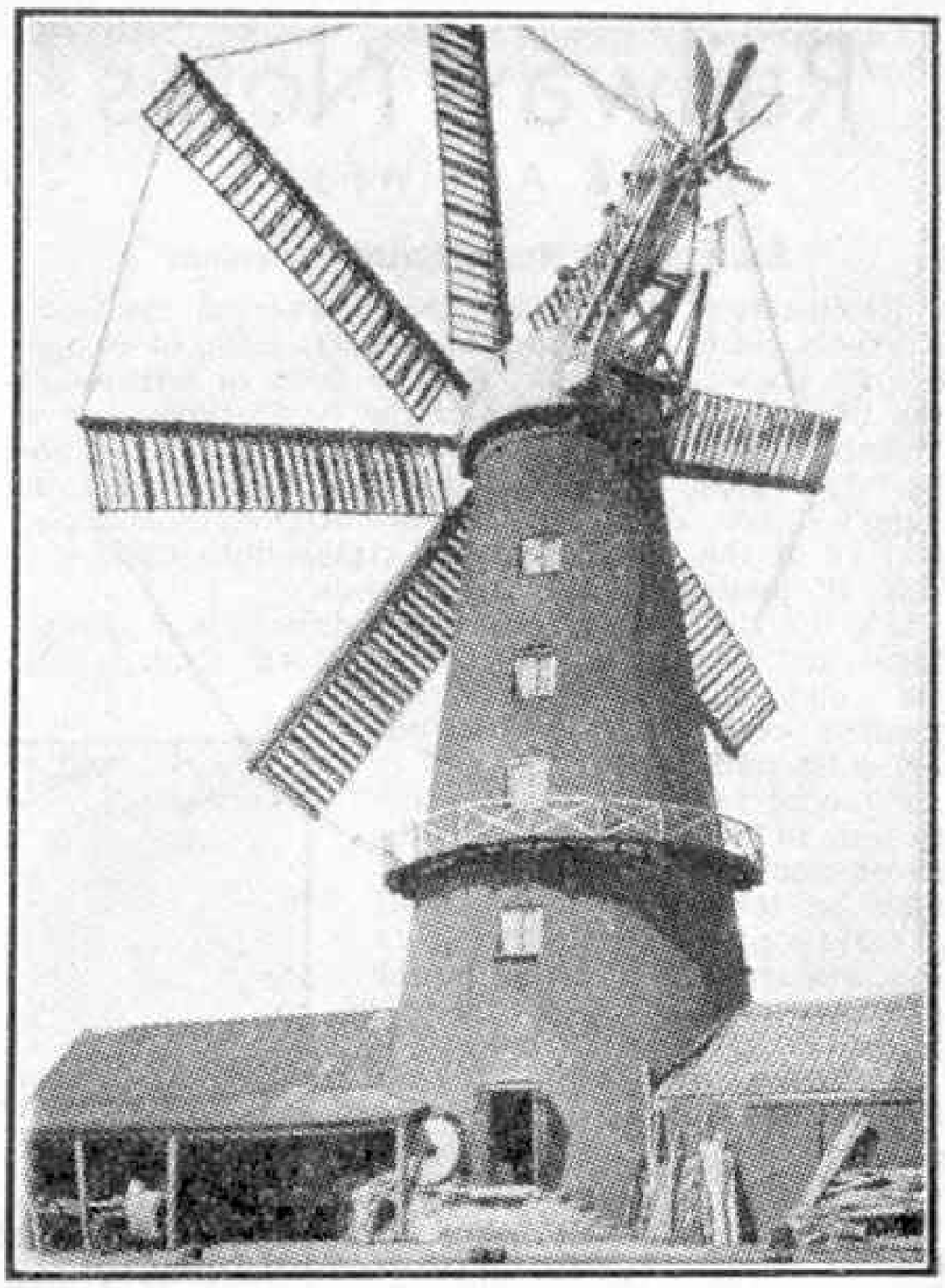
The rest of the show might well have been an anti-climax after that. But it wasn't. How could it be with pilots like Neville Duke, Jan Zurakowski, Mike Lithgow and Roly Falk on the bill, and the world's fastest, finest, deadliest and most advanced aeroplanes for them to fly? It is unfair to single out a few pilots or a few 'planes, for all were stars in this show, but, inevitably, everyone had their favourites. For many, they were Neville Duke and the sensational Hawker P.1067 fighter, which flashed by faster than the world's speed record and then shot up in a rolling climb and vanished from sight above the clouds, all in a few seconds. Then there was the graceful "Valiant," world's fastest bomber; the new butterfly-tailed Supermarine 508, world's most powerful naval fighter; (*Continued on page 572*)

Of General Interest

Windmills Old and New

The eight-sailed windmill seen in the illustration on this page is at Heckington, Lincolnshire, and is believed to be the only one now in use in the world. It dates back to 1830, and its sails rotate in the opposite direction to the hands of a clock when seen from the front. Now the sails are to be removed, and an engine is to be installed in order to provide the power required.

The old-time windmill has almost disappeared, but modern types that are more efficient are in prospect to produce electric power. Illustrations of these modern aero-generators with propeller blades were reproduced in an article in the March 1950 *"M.M.,"* which gave some account of the experiments that are being made in various parts of Great Britain with the aim of harnessing the power of the wind in this way. R. WINSTONE.



The eight-sailed windmill at Heckington, in Lincolnshire. Photograph by R. Winstone.

A Rival to the Radio Valve

Of late years successful efforts have been made to produce very small radio sets and electronic devices generally. The chief impulse towards their production has been the need to fit recording instruments of which they form part in rockets that climb high into the stratosphere in experiments carried out in the United States. The result has been the production of valves no bigger than paper clips, tiny transformers, and connection wire thinner than human hair.

In many cases wiring has been abolished altogether and in its stead "printed" paths have been introduced. These are made by drawing the wiring on insulating material in "ink" consisting of a silver solution. The solvent of this evaporates, leaving a trail of silver that acts as a wire.

In the meantime an entirely new radio device has been invented that threatens to displace the valve itself. This is called the transistor, and consists of germanium, a crystalline semi-conducting metal. In the early transistors the germanium crystal was touched by two fine wires, or "catswhiskers," but now a new form called the junction transistor has been developed, in which the crystal is placed between two plates, so that there is a large area of contact. In this form it acts in much the same way as a radio valve, but requires considerably less power.

A transistor occupies only about a two-thousandth of a cubic inch, while the smallest miniature vacuum tube is about an eighth of a cubic inch in size.

Rivers Create New Land

Rivers flowing down to the sea carry with them enormous amounts of sediment. Many of them show this plainly in being noticeably muddy, but it is not often realised how much material they deposit in the sea. Those that fall into the Gulf of Mexico have carried down sediment for more than 100 million years, and in that time they have removed 1½ million cubic miles of the surface of the central United States. The weight of this sediment is more than 15,000 million million tons, and if this could be built up into a column 2½ miles across it would be tall enough to reach to the Moon.

The whole of the sediment borne seaward by rivers is not irretrievably lost. At one time, far in the past, the Gulf of Mexico stretched hundreds of miles northward. The land that now exists between its previous shore and the mouth of the Mississippi to-day has been deposited by this mighty stream.

Railway Notes

By R. A. H. Weight

Eastern and North Eastern Regions

Reallocation of "Pacific" locomotives on the Great Northern Section provides for the grouping of engines of one class at a shed. At the time of writing all the 19 at King's Cross are of the "A4" type; nine at Peterborough are "A2"; Grantham has 11 "A1" and 10 "A3," most of which have been transferred from King's Cross. There are 10 "A3" at Doncaster depot, and 12 of the "A1" class are attached to the Leeds G.N. (Copley Hill or Ardsley) sheds.

All the "A3s" have been withdrawn from King's Cross and Copley Hill sheds. Thirteen of that class are allocated to the Great Central Section, divided between Leicester and Neasden.

Changes take place from time to time in the shedding or duties of particular engines, and there may be temporary withdrawals of certain passenger trains during the winter on account of coal shortage and heavy freight traffic.

Engines are changed at Peterborough or Grantham on some of the East Coast expresses, and also on King's Cross-Leeds trains, when booked to call at one or other of those places. For example this applies in the winter workings to the "*Flying Scotsman*," "*Heart of Midlothian*" and "*Northumbrian*." Certain other rosters have been altered, but some long daily mileages still apply.

"A1" No. 60137 is named "*Redgauntlet*," now shown all in one word, which is correct. The last "D2" G.N. 4–4–0, No. 62172, has been withdrawn. This leaves only the "D3," No. 62000. Some of the smaller "Claud Hamilton" 4–4–0s are being scrapped. More electric "EM1" 0–4–4–0 main line locomotives have been completed for the Sheffield-Manchester services, numbered from 26011 upward. "L1" 2–6–4Ts are working from Neasden Shed and are seen between Rickmansworth and Aylesbury, where the variety of engines noted lately included representatives of the London Transport (Metropolitan) "L44" 0–4–4T series. New class "2" 2–6–0 light mixed traffic locomotives have appeared from Darlington, numbered 46475–7 and on. They have been reported at work in the Scottish, North Eastern and Eastern Regions. These later engines have taller chimneys than the earlier members of the class.

A very fine run was made by the northbound "*Flying Scotsman*," which left Grantham 19 min. late with a heavy load headed by "A1" No. 60156, not yet named, in charge of Driver Marshall and Fireman Pickard of Grantham. In spite of a protracted signal stop on the outskirts of Doncaster the arrival at Newcastle was punctual. Allowing for the delay, an average of considerably over 60 m.p.h. was maintained throughout the 162 miles, with very fast travel along level or slightly rising grades between York and Darlington, and south of Doncaster. Another 4–6–2 of the same class, No. 60117 "*Bois Roussel*," shedded and manned at 37B, Copley Hill, with a lighter King's Cross Leeds express of 12 coaches, made up 5 min. between Grantham and Doncaster taking only 53½ min. for 50½ miles start to stop including two signal checks.

New Locomotives in Scotland

L.M.R. type class "4" 2–6–0 mixed traffic engines Nos. 43137–41 have been noted at work on various former L.N.E.R. services. Allocations include No. 43138, 65A, Eastfield, Glasgow; No. 43139, 12B, Carlisle Canal, now a Scottish Region shed; and Nos. 43140–1, 64E, Polmont. Some standard class "5" 4–6–0 arrivals at Perth and elsewhere were reported in the October "*M.M.*"

51 Miles Round London Without Reversing

On Saturday afternoon, October 6th, "B1" 4–6–0, No. 61175, from Stratford, carrying on S.L.S. (Stephenson Locomotive Society) headboard, left Kensington (Olympia) at 2.30 p.m. with over 500 railway enthusiasts of all ages on board a Western Region corridor train of 10 Coaches, all of the modern vestibuled type with tables. At 6.0 p.m. the complete assembly, smartly turned out in B.R. livery, returned from the opposite direction, having travelled 51½ miles without reversing in the course of the most remarkable circular tour by rail round London ever organised. This covered lines of several Regions, together with junctions and connecting links not used for regular passenger trains.

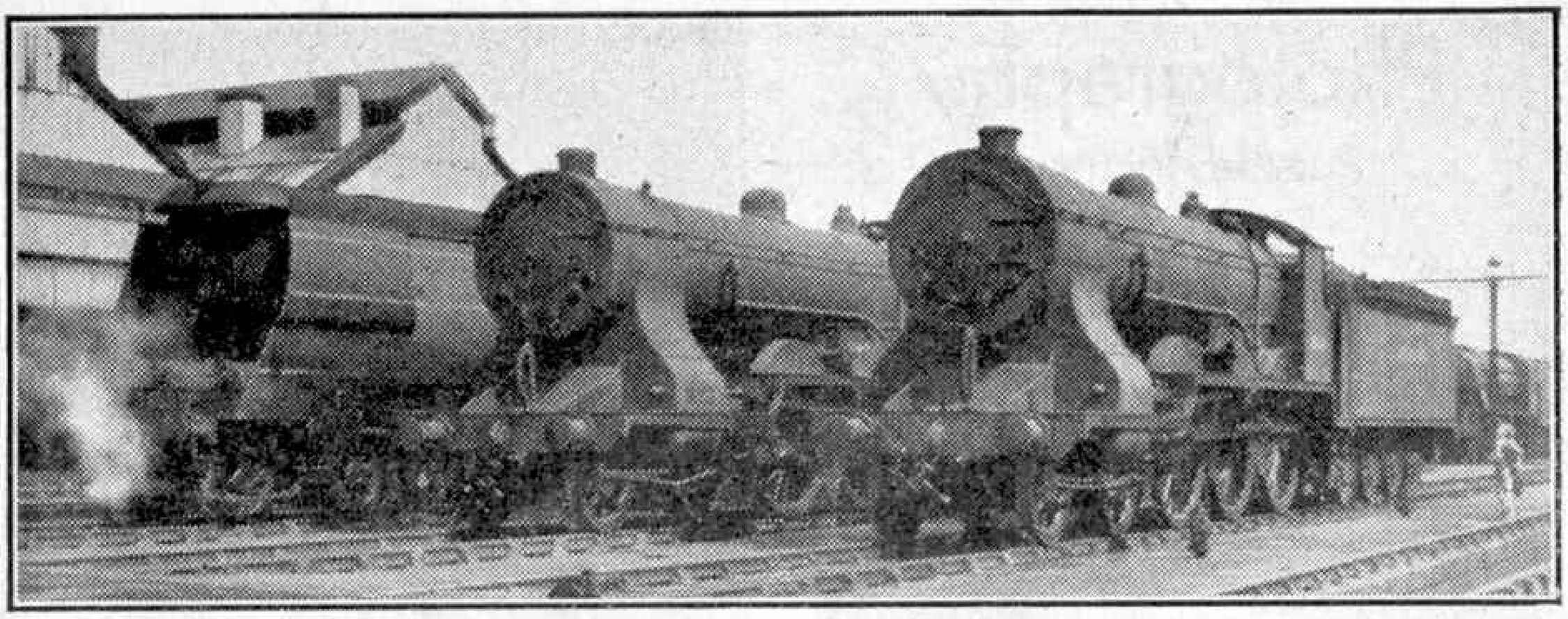
This prize-winning photograph, by "M.M." reader M. E. Ware, shows No. 7029 "Clun Castle" emerging from Dainton Tunnel with a Western Region Plymouth express.

We went through Willesden (High Level), Canonbury, Stratford, Tottenham, Cricklewood, South Acton, Richmond, Hounslow, Barnes and Clapham Junction, seeing, crossing, or travelling on all the main lines out of London except the S.R. Eastern Division, but even this was not far away. We passed close to Stratford Works and Locomotive Shed, King's Cross, Kentish Town, Willesden and Neasden Sheds, with views of many engines in several cases. We saw E.R. electric trains with overhead traction, travelled over tracks used by L.M.R. and S.R. electric services, and ran close to London Transport lines, with views on the way of important marshalling yards, carriage sidings and items of interest far too numerous to mention in detail.

London Midland News

Continuing the construction of class "4" 2–6–0s of L.M.R. design, Horwich Works has completed Nos. 43120–1, stationed at 14A, Cricklewood; following these came Nos. 43122–3 for the N.E. Region.

No. 43120 was noted on a St. Pancras-Tilbury boat special on 6th October and B.R. standard



Two of the now obsolete Drummond "Paddlebox" 4-6-0s of the L.S.W.R., Nos. 444 and 447, at Nine Elms, with S.R. 4-6-2 No. 34023 "Blackmoor Vale" in the background. Photograph by C. R. L. Coles.

class "5" 4–6–0, No. 73000, was reported to be on similar duties that week. Further engines of the 73000 series built at Derby include Nos. 73010–12, stationed at 20A, Leeds, and Nos. 73013–4 at 19B, Millhouses, Sheffield. The last named has been working into York.

New 0–6–0 diesel-electric shunters are numbered 12092–3, allocated to 3A, Bescot, and 3B, Bushbury respectively.

More former London, Tilbury and Southend 4–4–2Ts have been withdrawn. Nos. 41925 and 41961 of the series were lately observed at Nottingham, as was No. 40383, the last of the 6 ft. 6½ in. Johnson 4–4–0s of Midland origin. Some of the later Midland larger wheeled 4–4–0s, rebuilt and superheated, in class "2" are receiving general repair and new paint. Compound No. 40934, having been voluntarily cleaned with great care, still bore L.M.S. red livery when seen at Derby last summer. A sister Compound, 40933, has been hauling stopping trains in the Birmingham area.

"Jubilee" 4–6–0 No. 45700, formerly "*Britannia*," has been renamed "*Amethyst*," thus joining the series bearing famous ship names. Curiously enough, the pioneer of the class, No. 45552 "*Silver Jubilee*," appears to have been the last of this numerous 3-cyl. family to receive her B.R. number.

A new series of class "2" light 2–6–Ts is under construction at Crewe, with numbers commencing at 41290. The earlier engines of the series have arrived on the Southern Region and have been noted at Tunbridge Wells, Brighton and Three Bridges. One of those completed shortly before, No. 41287, worked the "*Welsh Dragon*" fast local holiday train last summer daily between Rhyl and Llandudno.

The Last of the "Paddleboxes"

Early in the present century, on account of increasing traffic, speeds, and weight of express trains, Locomotive Engineers of many of the then separate railways were turning their attention to the development of 4–6–0 engines, sometimes trying 4 cylinders in order to provide greater power than the 2-cylinder 4–4–0s then still much in use. The Drummond "T14" 4–6–0s for the London and South Western Railway, now all withdrawn, were built in 1911–12. They were perhaps, the best of several Drummond 4–6–0 classes, which had rather a chequered history. Over the three driving wheels they had a very large single splasher on each side, containing a circular door for inspecting the motion; hence the nickname "Paddlebox." They looked very different in later days, for after rebuilding they appeared with raised framing in place of the original low straight running plates and with small separate splashers, together with other alterations. They made a distinctive sound when running, and though they had good performances to their credit, they recall memories of some rather feeble runs when heavily loaded on principal expresses in L.S.W.R. days. Lately they have been on secondary work.

A wintry scene on the L.M.R. near Longsight; No. 45638 "Zanzibar" getting into her stride with the up "Mancunian." Photograph by Arthur Phillips.

Permanent Way Engineering Developments

The Western Region announce that electric hammers are being used for the consolidation of ballast under the timbers of point and crossing work. These are a considerable improvement on shovels, so the practice is being extended.

The procedure is to open out the ballast and lift the track by jacks to the required level, the easily operated hammers being then put to work, usually in pairs. The necessary power can be taken at 110 volts, either from the mains with transformers, or by 110-volt portable generators brought to the site. This is another of the modern means of securing rapid completion of track renewal or repair work.

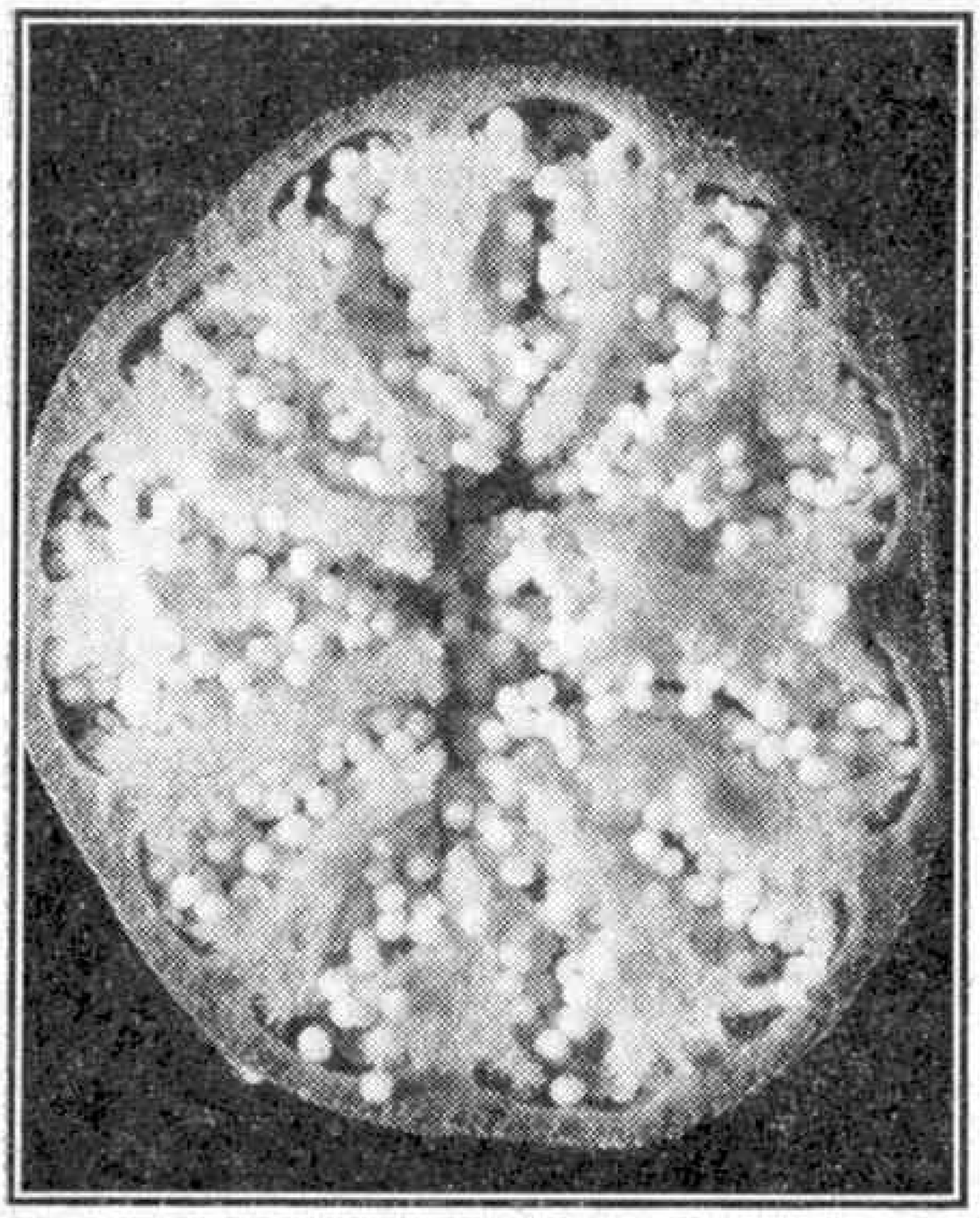
Photography

Puzzle Pictures

By E. E. Steele

PUZZLE games have always formed a popular part of the Christmas festivities, and puzzle pictures made with your own camera are just the thing to fill in an odd half hour when the usual games have become a little stale.

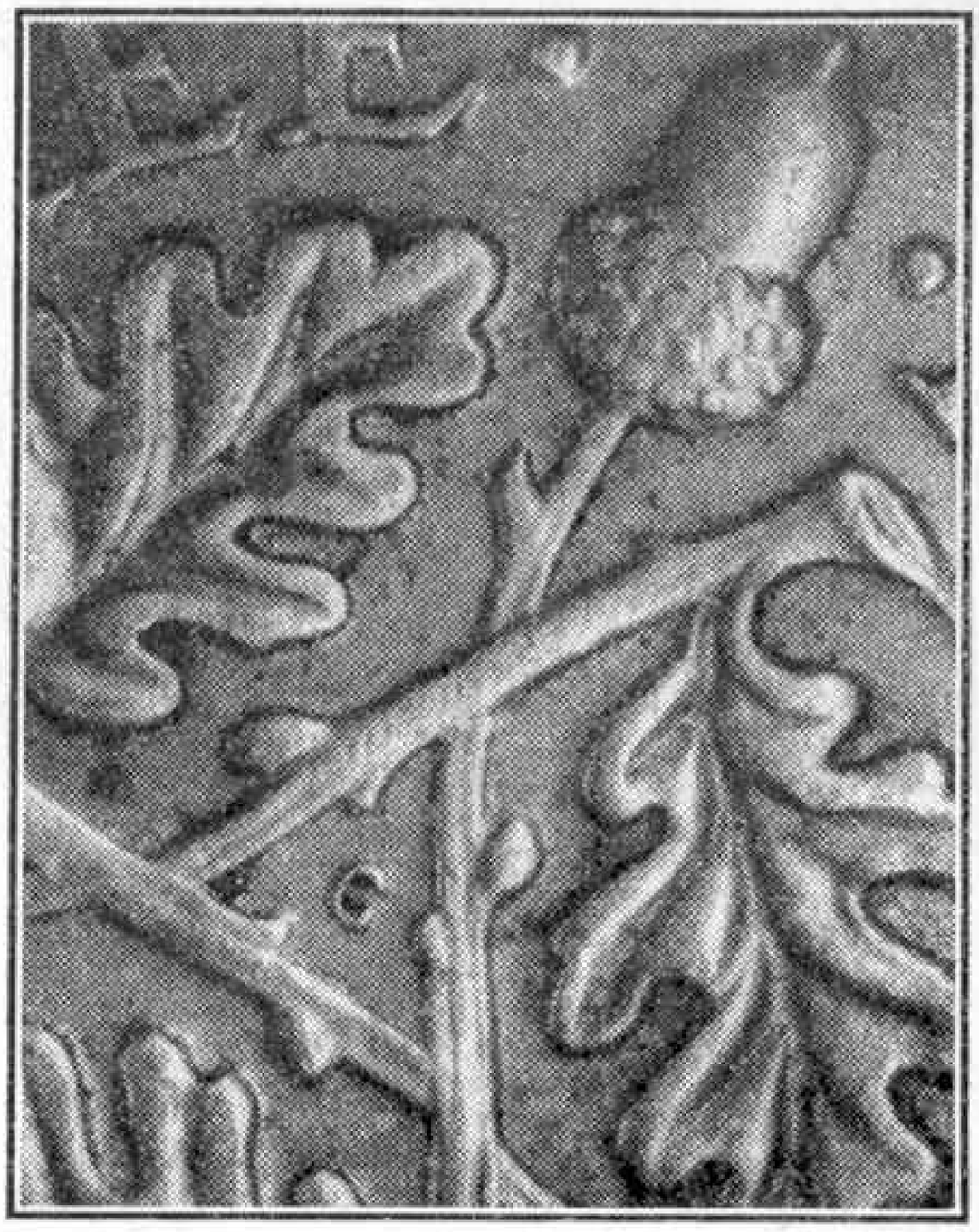
There are two kinds of puzzle pictures, those which are taken by chance when photographing outdoors



Slice through head of garden poppy, showing the seeds.

in the normal way, with perhaps an eye for the unusual, and the puzzle picture proper that is made deliberately to tax the minds of the clever ones among your friends. The easier to take are the outdoor ones. Many subjects abound but may take some naming without giving quite a little thought to the matter. One of our illustrations shows an ingenious use of some old mill-stones which have been converted into tables in the tea garden of that interesting old coaching inn "The Ram Jam," situated on the Great North Road near Grantham. This is but one of many interesting subjects that are well worth taking for their puzzle value.

The second kind of puzzle picture is the one deliberately planned to deceive. A favourite dodge is to photograph some common object at very close quarters so that it is about life-size on the negative. This negative is then further enlarged several times, so that the final print contains only a very small portion of the original object. This method is illustrated by my photograph of a very small part of a silver threepenny-bit. People connect the oak leaves with all kinds of things except a coin.



Portion of silver threepenny-bit greatly enlarged. The illustrations to this article are by the author.

Not all cameras have means of taking such close-up photographs, but many permit of using supplementary lenses, or even spectacle lenses over the normal lens, thus enabling the camera to be brought much nearer to the object. Makers of these lenses usually supply tables of distances at which the camera is to be set. A better way is to use a reflex camera, or an old plate camera, where the object is viewed and sharply focused on a ground-glass screen, thus obviating errors and making certain that the negative is sharp, which it must be if further enlargement is to be carried out successfully.

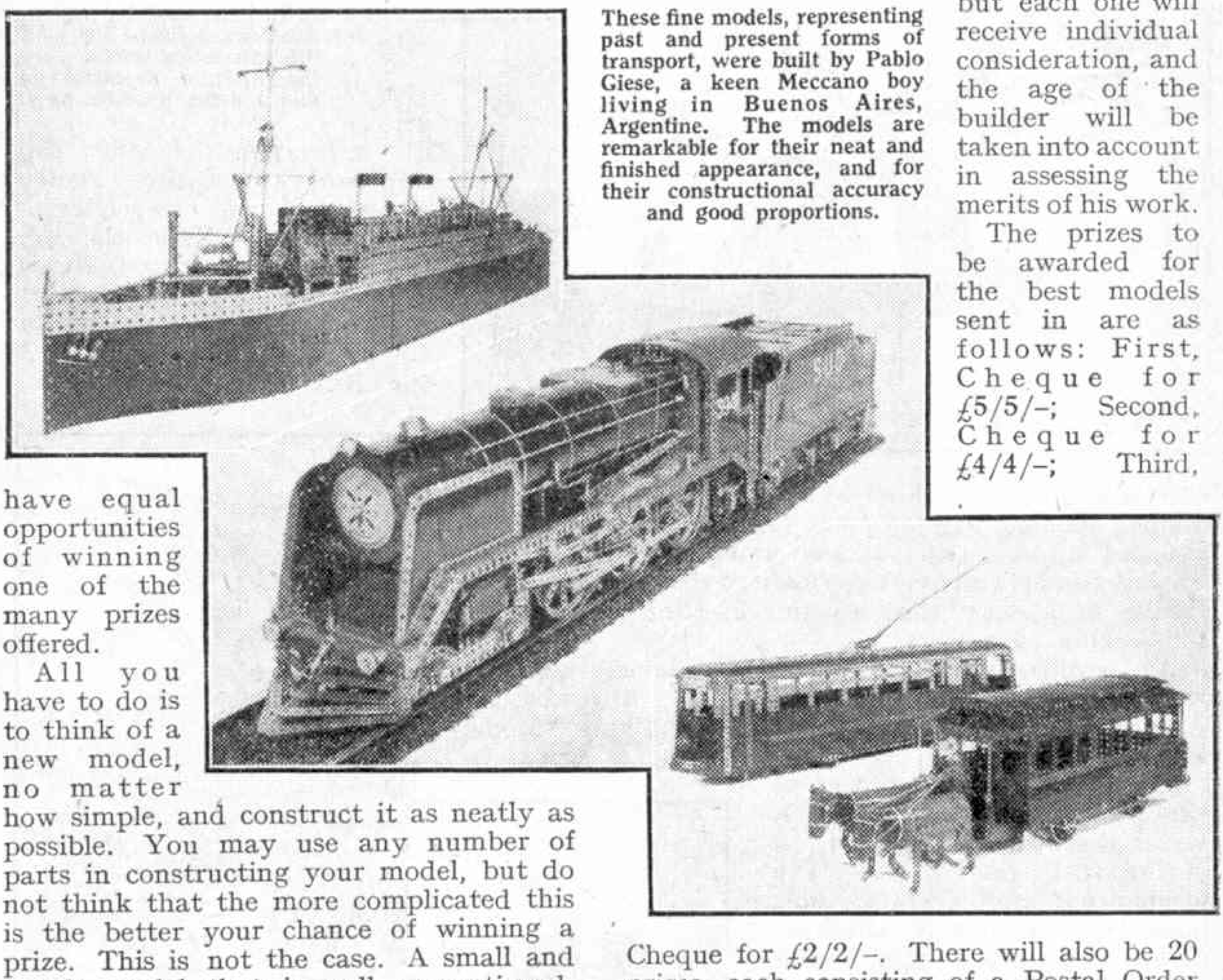
Using this method, many common objects of the household may be used to make really puzzling photographs, which may be used with those natural objects found in your own district. Old things falling into disuse are especially valuable.

Old mill-stone used as table in tea garden of the Ram Jam Inn, near Grantham.

Cash Prizes for Model-Builders

Enter Our Special Christmas Contest

IF you own a Meccano Outfit, this competition offers you a splendid chance to win a cash prize. If you have already won a prize in an "*M.M.*" contest you may be successful again. If you have not, or if you are a newcomer to the hobby, you should send in an entry for this competition, for all competitors will have equal opportunities of winning one of the many prizes offered.



These fine models, representing past and present forms of transport, were built by Pablo Giese, a keen Meccano boy living in Buenos Aires, Argentine. The models are remarkable for their neat and finished appearance, and for their constructional accuracy and good proportions.

All you have to do is to think of a new model, no matter how simple, and construct it as neatly as possible. You may use any number of parts in constructing your model, but do not think that the more complicated this is the better your chance of winning a prize. This is not the case. A small and simple model that is well proportioned, and strongly constructed, is better than a larger and more intricate one that is lacking in these qualities.

In entering this contest you should try to be as original as possible, for in making the awards the judges will pay special attention to models showing that their builders have been enterprising in the search for new subjects, and have not just been content with variations on the models included in the Meccano Manuals of Instructions. There are thousands of interesting subjects for you to choose from, but if after all you cannot think of a really new one, then try to incorporate in your car, aeroplane, locomotive or other model a new use for a Meccano part, or a little detail work. **You have until 31st March 1952 to send in your entry.**

All the entries in this contest will be grouped together, but each one will receive individual consideration, and the age of the builder will be taken into account in assessing the merits of his work.

The prizes to be awarded for the best models sent in are as follows: First, Cheque for £5/5/–; Second, Cheque for £4/4/–; Third, Cheque for £2/2/–. There will also be 20 prizes, each consisting of a Postal Order for 10/–, with 25 consolation awards each of 5/–, and other good efforts will be recognised by the award of Certificates of Merit.

It is important to note that *actual models must not be sent.* All that is required is a good sketch, or better still a photograph of the model it is desired to submit, together with a few brief details of its main features. Entries should be addressed "*Christmas Model-Building Contest, Meccano Ltd., Binns Road, Liverpool 13.*"

The "Octopus" in Meccano

An Australian Reader's Fine Model

G. E. Vale, Grafton, N.S.W., Australia, designed and built the interesting model fun-fair machine described on this and the opposite page.

MOST *"M.M"* readers will no doubt be familiar with the "Octopus" which is the name given to one of the more modern joy-riding machines to be seen in Fun Fairs. It consists of a number of rotating arms, each of which carries at its outer end a small pivoted passenger car. As the arms rotate they rise and fall, and the combined movement, coupled with the independent pivotal movement of the cars themselves, results in a very thrilling and exciting ride for the fun-seeking passengers.

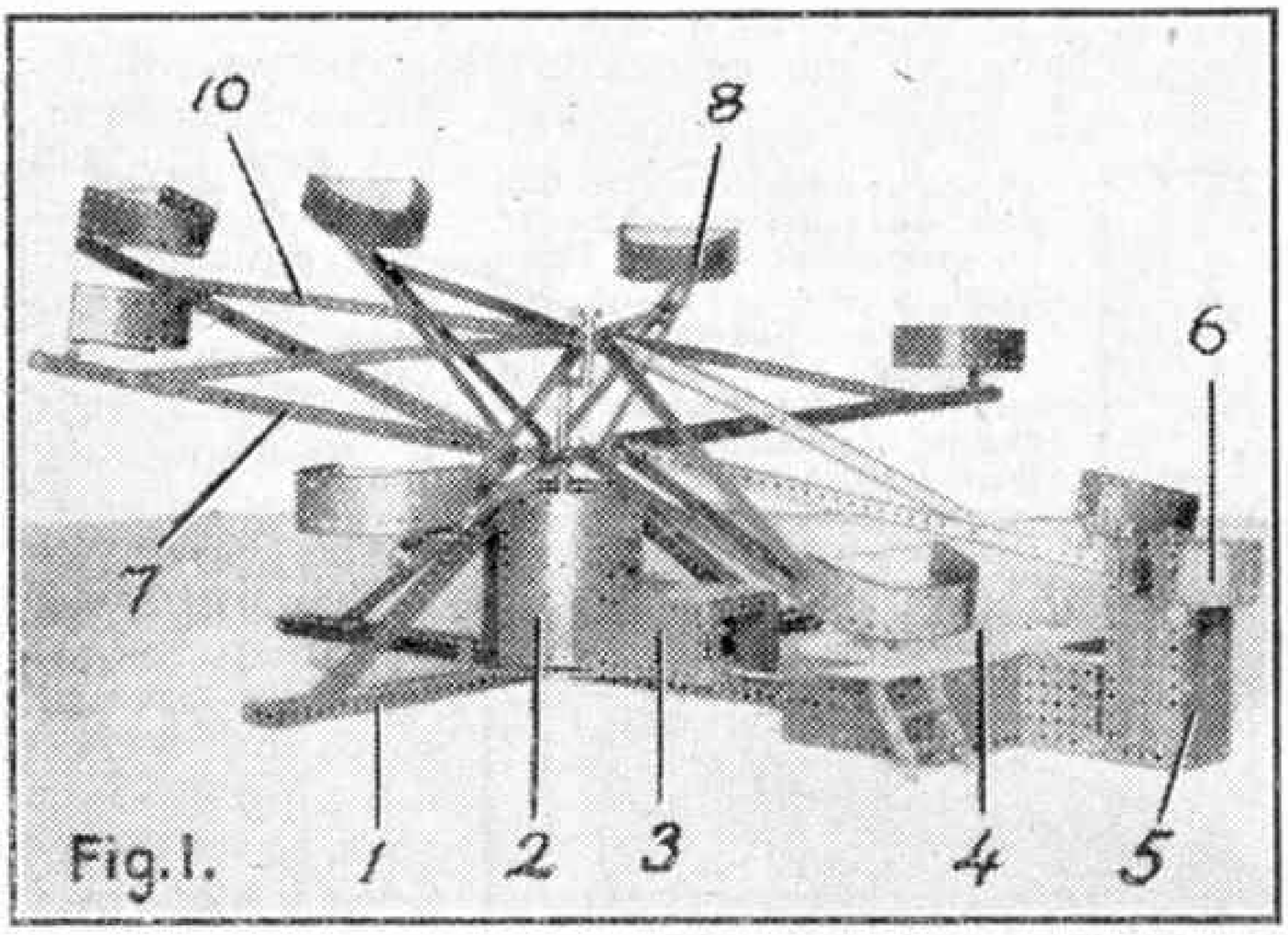


Fig. 1.

An excellent model of one of these devices was built recently by G. E. Vale, Grafton, N.S.W., Australia, and was awarded Second Prize in the "Winter" Model-Building Contest.

The general appearance of this model is shown in Fig. 1. It consists of a base 1, a cylindrical centre 2, the mechanism and power unit housed in the box 3, alighting platform 4, ticket box 5 and control platform 6 above it, and the top structure comprising revolving arms 7, each fitted with a car 8.

The rise and fall of the arms is due to the off-set centre 9 (Fig. 2) which is the main mechanical feature of the model. This off-set centre, to which the arm supports 10 are pivotally attached, is driven independently of the assembly 11 and arms 7, which are lock-nutted to it. The arms 7, which carry the seats, are geared to move faster than the off-set arm 9 thus causing the angle of inclination of the top structure to revolve slowly while the arms travel at a faster speed. While the top structure is revolving the cars are continually turning about their pivots. This is due to the positions of the pivots and the fact that the cars are heavier at the back.

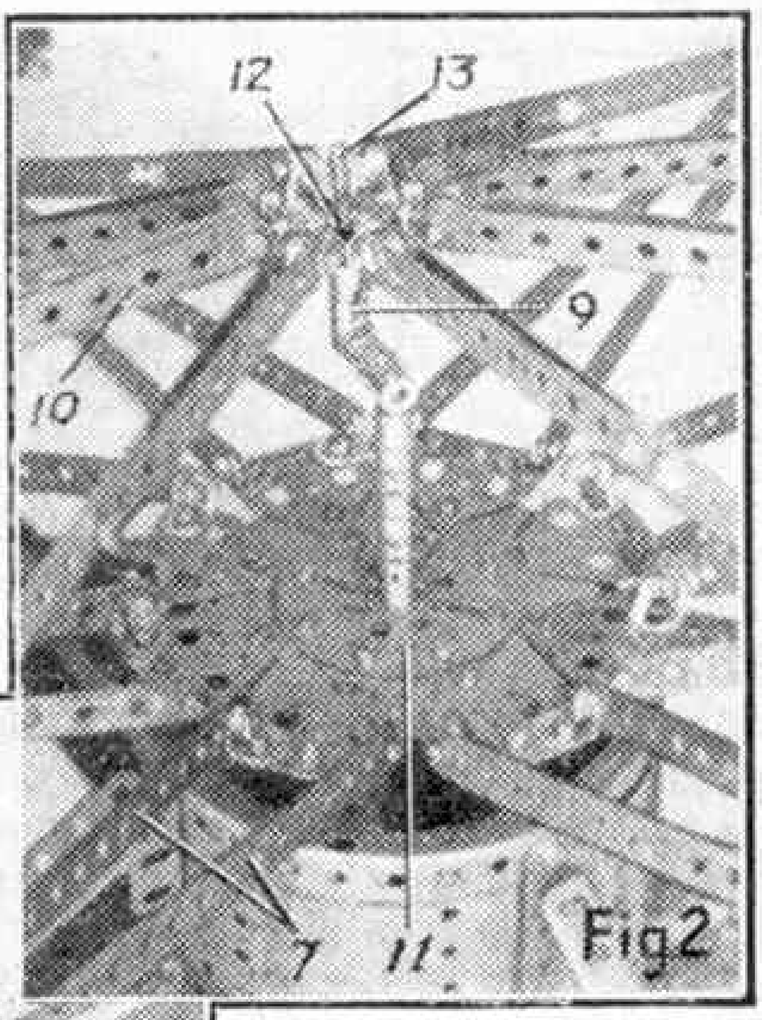


Fig. 2

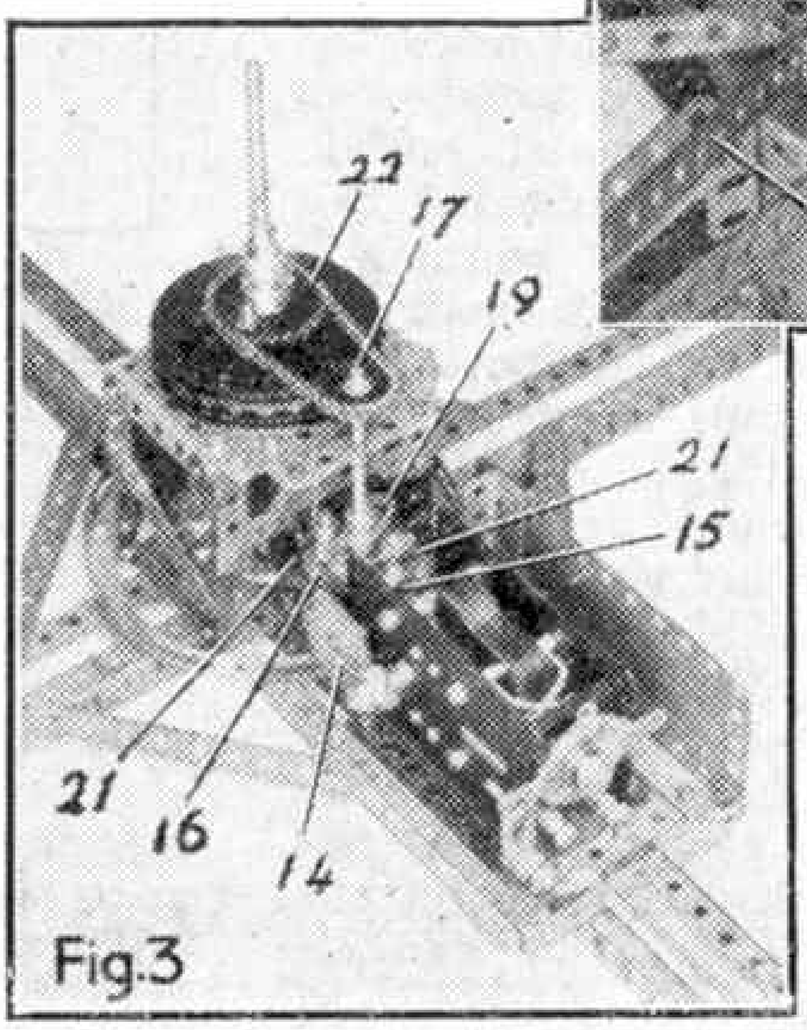


Fig. 3

The off-set centre 9 (Fig. 2), which is built up on the Bush Wheel 12, is free to revolve on the Rod 13. The assembly 11 consists of a 4" Circular Plate to the top of which eight 2" Strips and

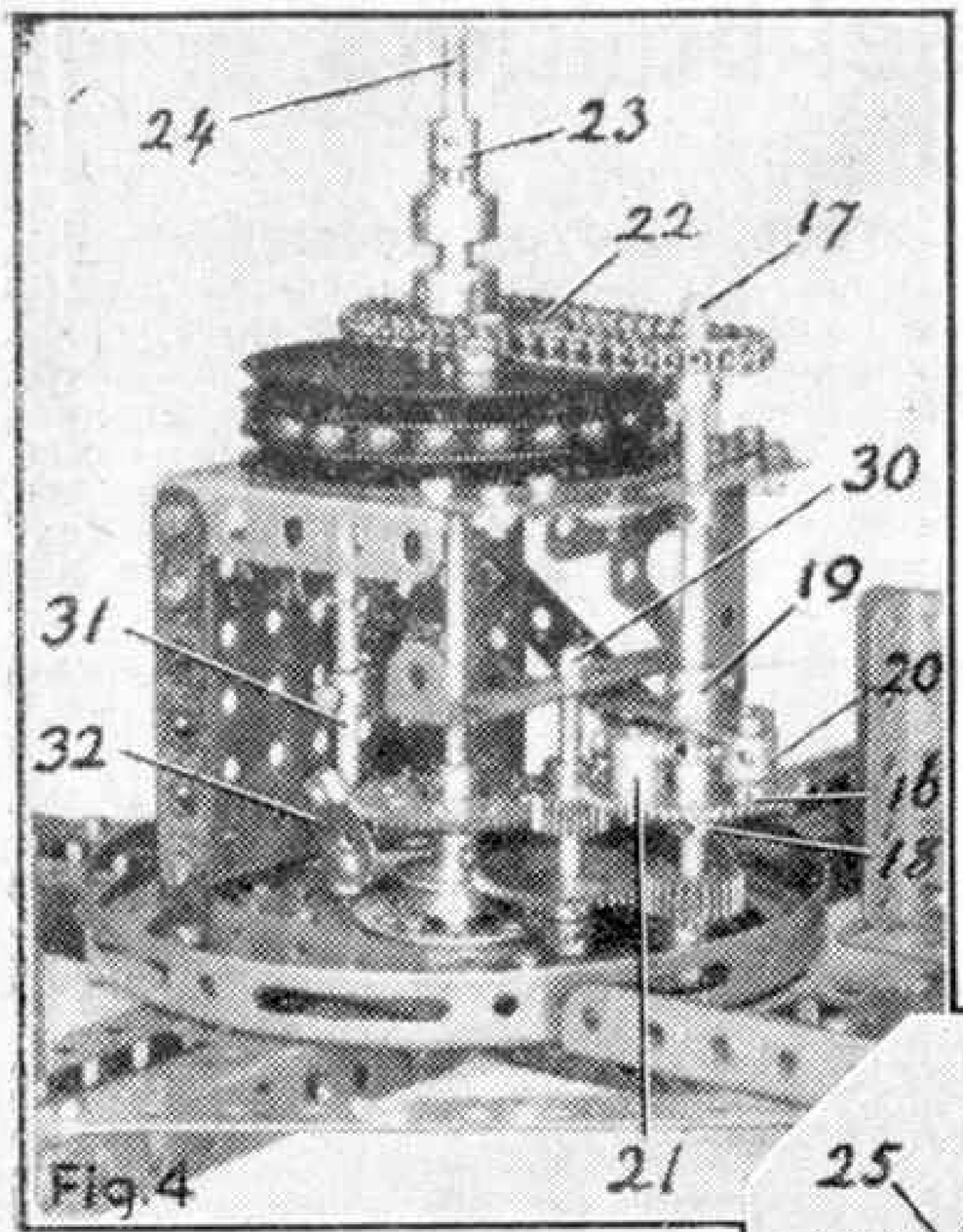


Fig.4

a 2½″ Face Plate are bolted. Eight Flat Trunnions are bolted to the outer ends of the 2″ Strips, and to the underside of the 4″ Circular Plate a further 2½″ Face Plate, the boss of which is locked in a Socket Coupling, is bolted.

The drive from the E20R Electric Motor is transmitted to the 57-tooth Gear 14 (Fig. 3) by a ½″ Pinion on the Motor armature shaft. The 57-tooth Gear 14 is mounted on a 2½″ Rod journalled in the Motor sideplates, and a Worm 15, which is also fixed on this Rod, meshes with a 57-tooth Gear 16.

A Collar 18 (Fig. 4) supports the Gear 16, which is spaced by four Washers from the Double Arm Crank 19 fixed on Rod 17. A spider 20 taken from a Swivel Bearing, is bolted to one end of the Double Arm Crank as shown, and is fitted with two $\frac{7}{32}$″ Grub Screws. Two Threaded Bosses 21, fitted with ½″ Bolts, are bolted to the Gear 16, and two Compression Springs are retained in position between the ends of the ½″ Bolts and Grub Screws.

When the Motor is switched on or off these Springs absorb the momentum of the top structure and prevent jerky starting and stopping.

Sprocket Chain transmits the Motor drive to the 1½″ Sprocket 22 (Figs. 3 and 4) which is spaced from the upper 3″ Pulley of a ball bearing unit by one Collar and two Washers on each bolt. This bearing supports the revolving structure carrying the arms. The boss of Sprocket 22 is held in a Socket Coupling, which also holds one end of Coupling 23.

The Socket Coupling that holds the boss of the 2½″ Face Plate is fastened to the top of Coupling 23, thus completing the link-up of the drive to the assembly 11 (Fig. 2) but leaving the Rod 24 free.

A bearing for the Coupling 23 is provided by the central hole of the Hub Disc forming the top of the cylindrical housing.

The drive to the off-set centre 9 (Fig. 2) is transmitted through the reduction gearing shown in Fig. 4 to the Rod 24. With this gearing the off-set centre is driven at about one-fourth the speed of the assembly 11. A bearing to take the weight supported by Rod 24 is formed by a ¾″ Flanged Wheel, which turns on the boss of a 1½″ Pulley bolted to the base (Fig. 4).

To enable passengers to

(Continued on page 572)

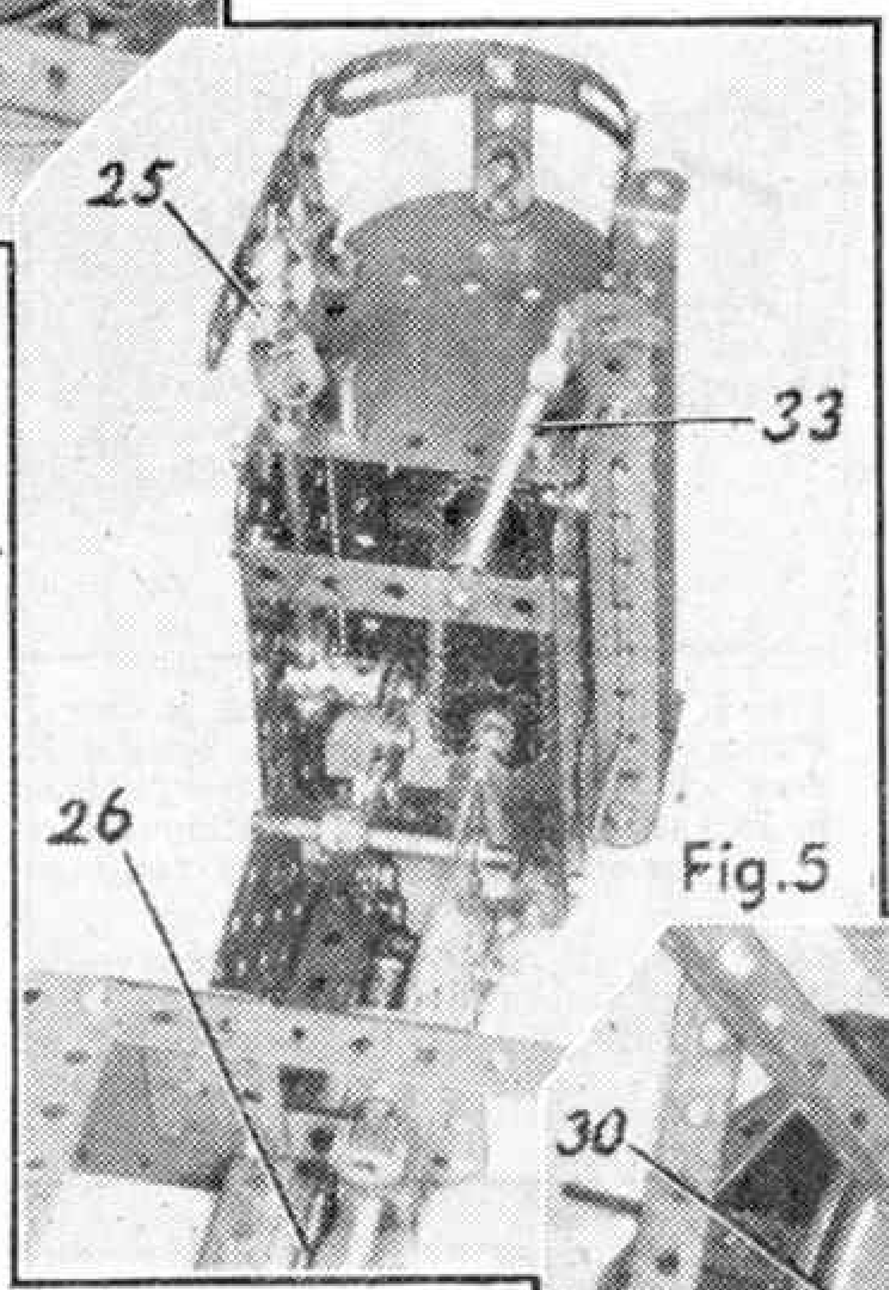


Fig.5

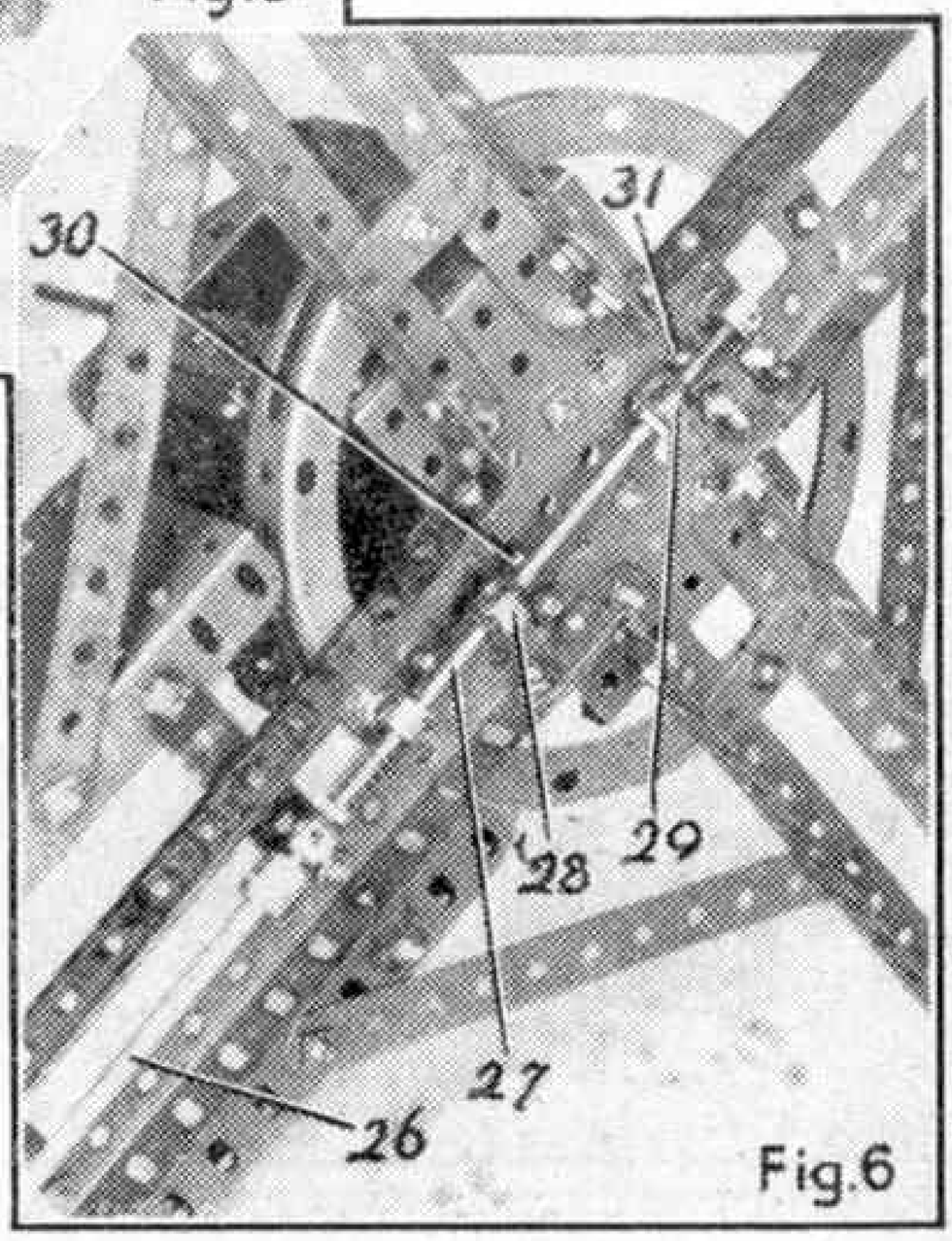


Fig.6

Among the Model-Builders

By "Spanner"

AN AMUSING TOY FOR YOUNG MODEL-BUILDERS

Younger readers will be interested in the simple but amusing little model sent in by Eric Howell, Dronfield, Sheffield, that is shown in Fig. 2 at the foot of this page. It consists of two figures mounted on a wheeled carriage. When the carriage is pushed along the ground the figures are set in motion and appear to be bowing to each other in a really laughable way.

The construction of the figures and the carriage can easily be followed from the illustration. It must be explained, however, that the arms of the figures are pivoted on a Rod passed through the upper end of a Strip, the lower end of which is attached to a simple crank formed in the axle of the road wheels.

The legs and arms of the figures are attached to the Cylinders representing their bodies, so that they can pivot or move freely in relation to each other. To do this the parts are bolted together as usual, but the nut is not screwed up tightly so that the parts are not gripped. Then to prevent the nut from unscrewing, a second nut is screwed up tightly against it, the first nut being held meanwhile with a Spanner. This method of using a second nut is known as lock-nutting, and is very frequently used in Meccano model-building.

The figures are loosely attached also to the carriage by Bolts passed through their legs and into Angle Brackets fixed to the carriage. These Bolts too are lock-nutted.

MAKING BOX-FORM STRUCTURES

In building some models completely closed in or box-like structures are required and the assembly of these is made quite simple by the use of Screwed Rods of various sizes. Three sides of the structure should be built up in the usual manner, using ordinary nuts and bolts. The remaining side can then be fixed in position by passing Screwed Rods right through the structure from the opposite face and fitting nuts to the ends of the Rods.

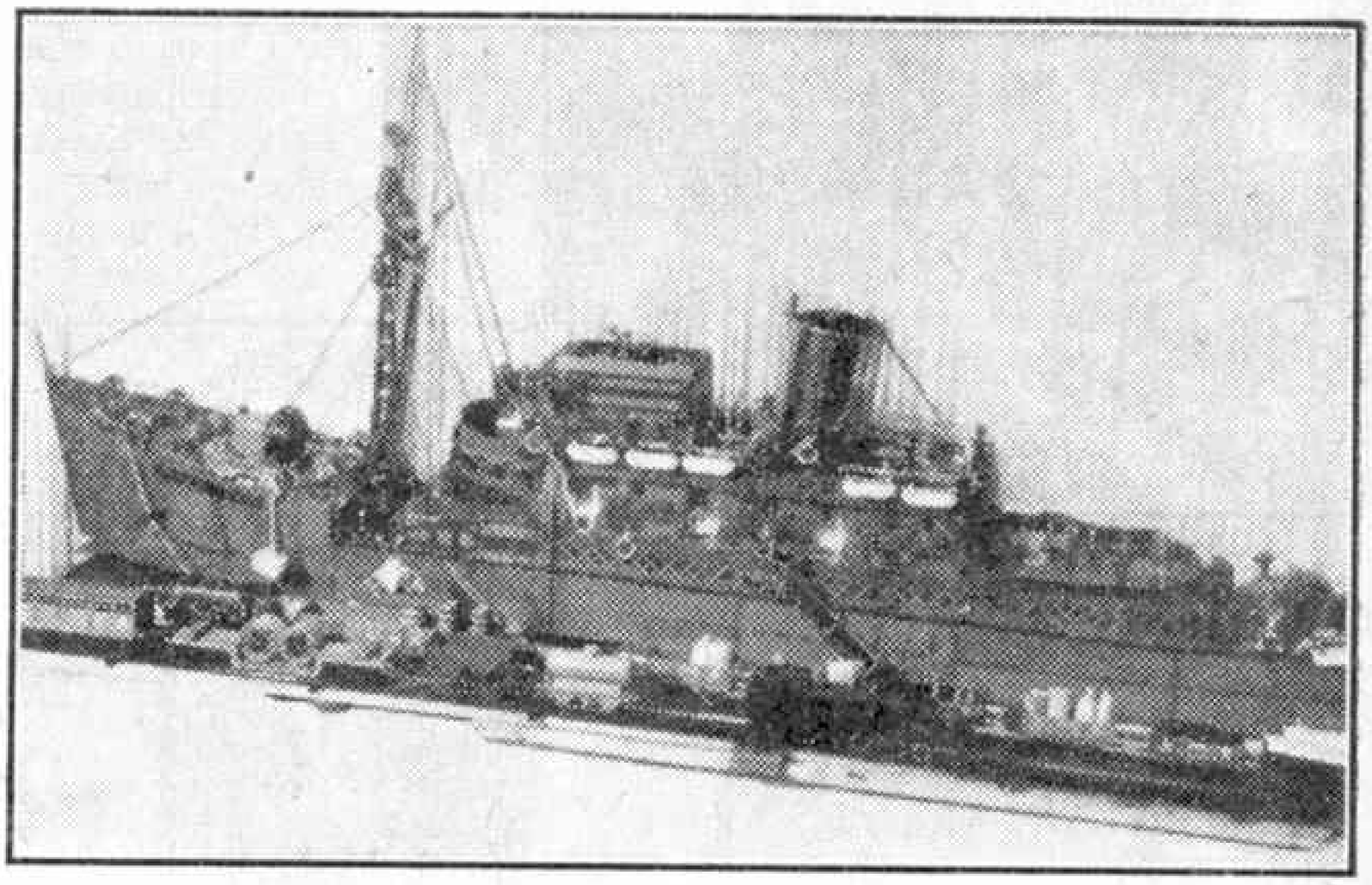


Fig. 1. This model ship, which is over 7 ft. in length, was built by Mr. K. J. Prince, and his son Anthony, Buenos Aires. It is electrically lighted and has deck winches operated by a 20-volt Motor. Over 1,000 nuts and bolts are used in the structure. The illustration shows the effective results obtained by the use of Hornby Trains in conjunction with a model of this kind.

AN EXTERNAL CONTRACTING BRAKE

W. Johnstone, Liverpool, sends details of a powerful brake mechanism he designed for use in a large model of a colliery winding engine he built recently. The brake is based on the external contracting system, and is shown in Figs. 3 and 4. The large braking area of the shoes, and the linkage system employed to bring them into contact with the drum, provide a very powerful retarding effect, which can be further increased by fitting a length of adhesive tape over the drum as shown in Fig. 4.

In the illustrations the brake is shown fitted to a backplate consisting of a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate bolted to a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate that forms the base. A second $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate, which is also fixed to the base, supports the outer ends of the winding drum shaft and the Rods

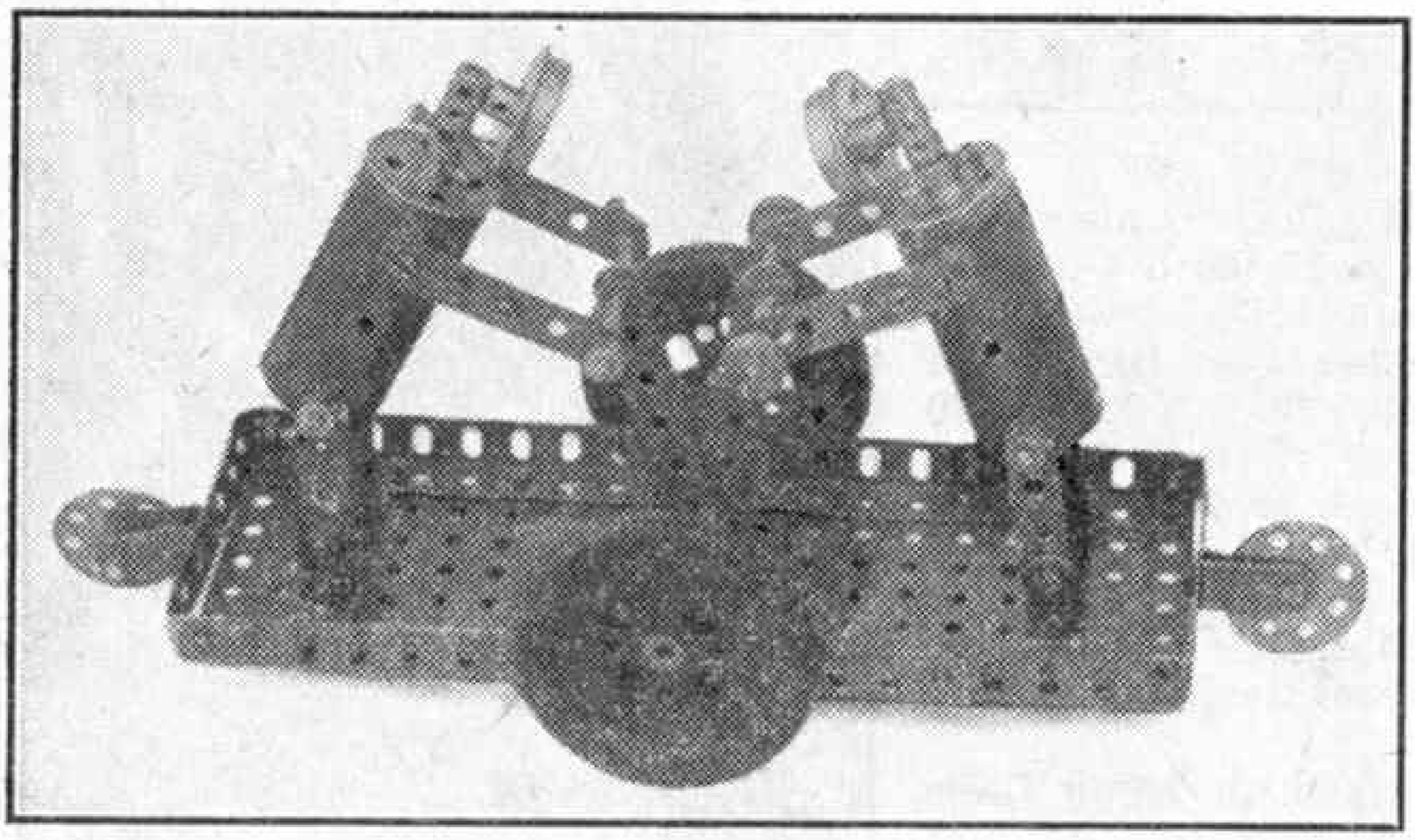


Fig. 2. This simple and amusing mechanical toy was designed by Eric Howell, Dronfield, Sheffield, and is described on this page.

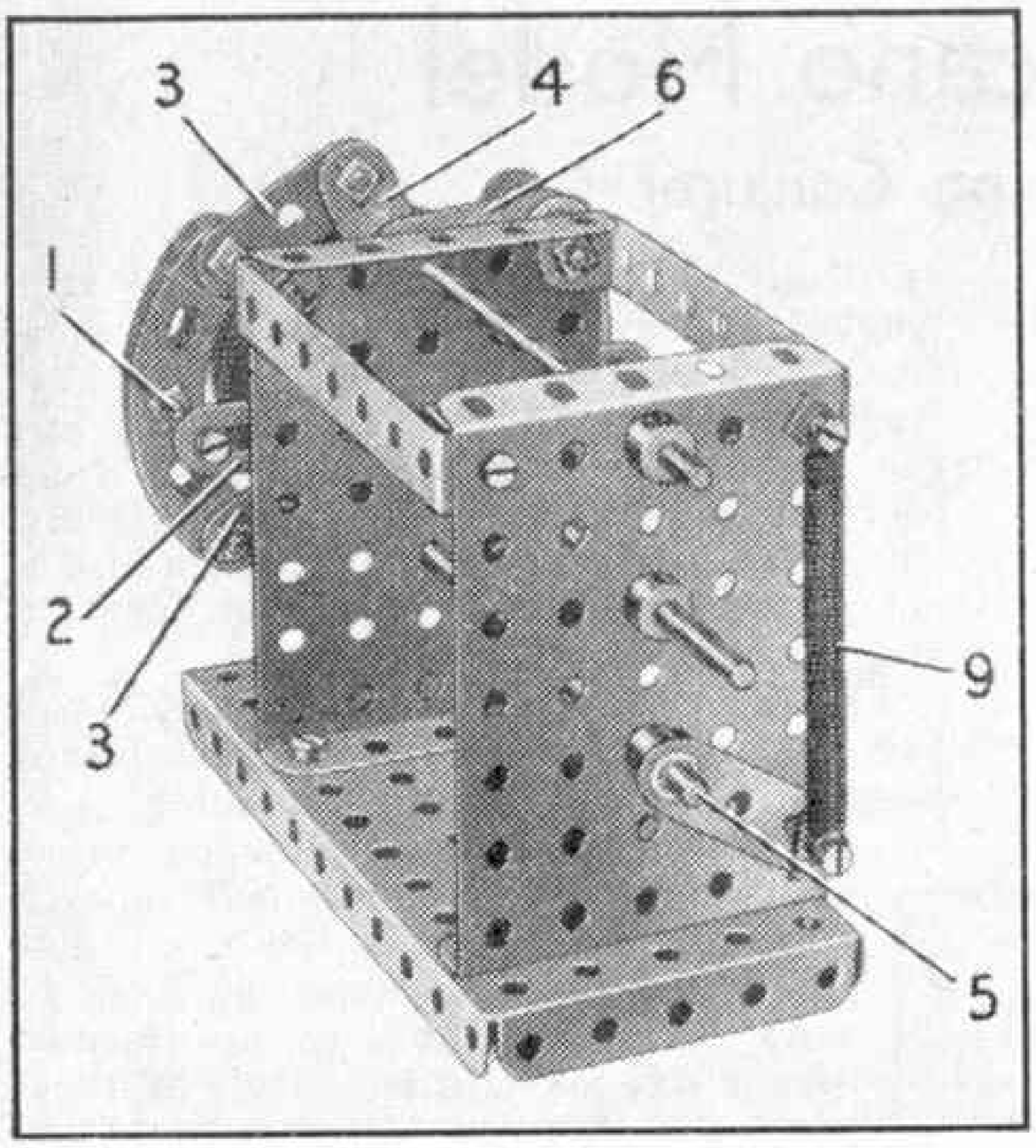


Fig. 3. A powerful external contracting brake suitable for use in colliery winding engines and large cranes.

carrying the brake levers. This arrangement can be varied of course to suit any particular model.

The brake drum is a Wheel Flange, and is attached to a Bush Wheel held on the winding drum shaft. Each brake shoe consists of eight 2½" stepped Curved Strips fixed together by a 1⅛" Bolt 1. This Bolt is passed through the slotted hole of a 2" Slotted Strip 2 attached to the backplate.

A 1½" Strip 3 is pivotally attached by a lock-nutted ⅜" Bolt at each end of the brake shoe, and these Strips are also lock-nutted to Double Arm Cranks. One of the Double Arm Cranks is indicated at 4, and the other is fixed to the end of Rod 5. The second brake shoe is fitted with 1½" Strips in a similar manner, and these are lock-nutted to the free ends of the Double Arm Cranks.

A Crank 6 is fixed on the same Rod as Double Arm Crank 4, and a second Crank extended by a 3½" Strip 7 is fixed on Rod 5. The Cranks are linked together by a 2½" Strip 8, so that when the Strip 7 is depressed by the foot pedal the movement is transmitted to them. The action of the Cranks causes the brake shoes to contract on the drum. A Spring 9 is used to pull the shoes to the "off" position when the pedal is released.

MECCANO DRIFT—A USEFUL TOOL

In many models it is necessary to bolt several parts together, and it is sometimes difficult to line up the holes in these parts so that the bolt can be passed through easily. If the bolt is forced through the holes the threads may be damaged. The Drift, Part No. 36c, has the same diameter as a standard Rod, but one end is tapered off to a point. This point can be pushed through the holes of several parts so that these are brought exactly into line, allowing a bolt to be inserted easily. A Drift is also useful for ensuring that bearings are in line.

USING MECCANO GEARING

For small models, and for drives transmitting little power, Pulleys and Cord are often employed. In most cases these are quite satisfactory for the purpose, but they are of little use where accurate speed ratios are necessary, owing to the slip that may occur in the belts. For this reason the method is seldom used in models of the larger and more complicated types. Sometimes Sprocket Chain and Sprockets will be found extremely useful. This system provides a positive drive, and is of great value for transmitting drives from one shaft to another placed some distance apart, but a drive transmission of this type is really only practicable when the shafts are horizontal.

The most satisfactory drive transmission arrangements are based on the use of gearing, as gears can be adapted to suit all circumstances, no matter whether the shafts are horizontal, vertical, in line or at an angle to each other. The wide range of gears included in the Meccano system provides the model-builder with ample scope for assembling almost any kind of drive transmission, but to make the fullest use of these gears it is essential to know the ratios that are obtainable from various combinations.

It is not possible to mention all the practical combinations here, but I am giving a few examples, in the hope that they will be of help to younger model-builders and will encourage them to experiment with the many fascinating mechanisms it is possible to assemble that depend for their functioning on accurate gear ratios.

The greatest ratio possible in a single stage of Meccano spur gearing is 7 : 1, and is provided by a ½" Pinion meshed with a 3½" Gear Wheel. The largest ratio provided by two Gears **of any kind,** however is 133 : 1, and is obtained by meshing a Worm with a 3½" Gear Wheel. Two of the most generally useful Meccano gear combinations, comprise a ¾" Pinion in mesh with a 50-tooth Gear or a ½" Pinion engaging a 57-tooth Gear, which give ratios of 2 : 1 or 3 : 1 respectively.

A ratio of 1 : 1 is obtained by meshing two spur Gears of similar diameter, such as two ½" Pinions, two 1" Gears or two ⅞" Bevel Gears.

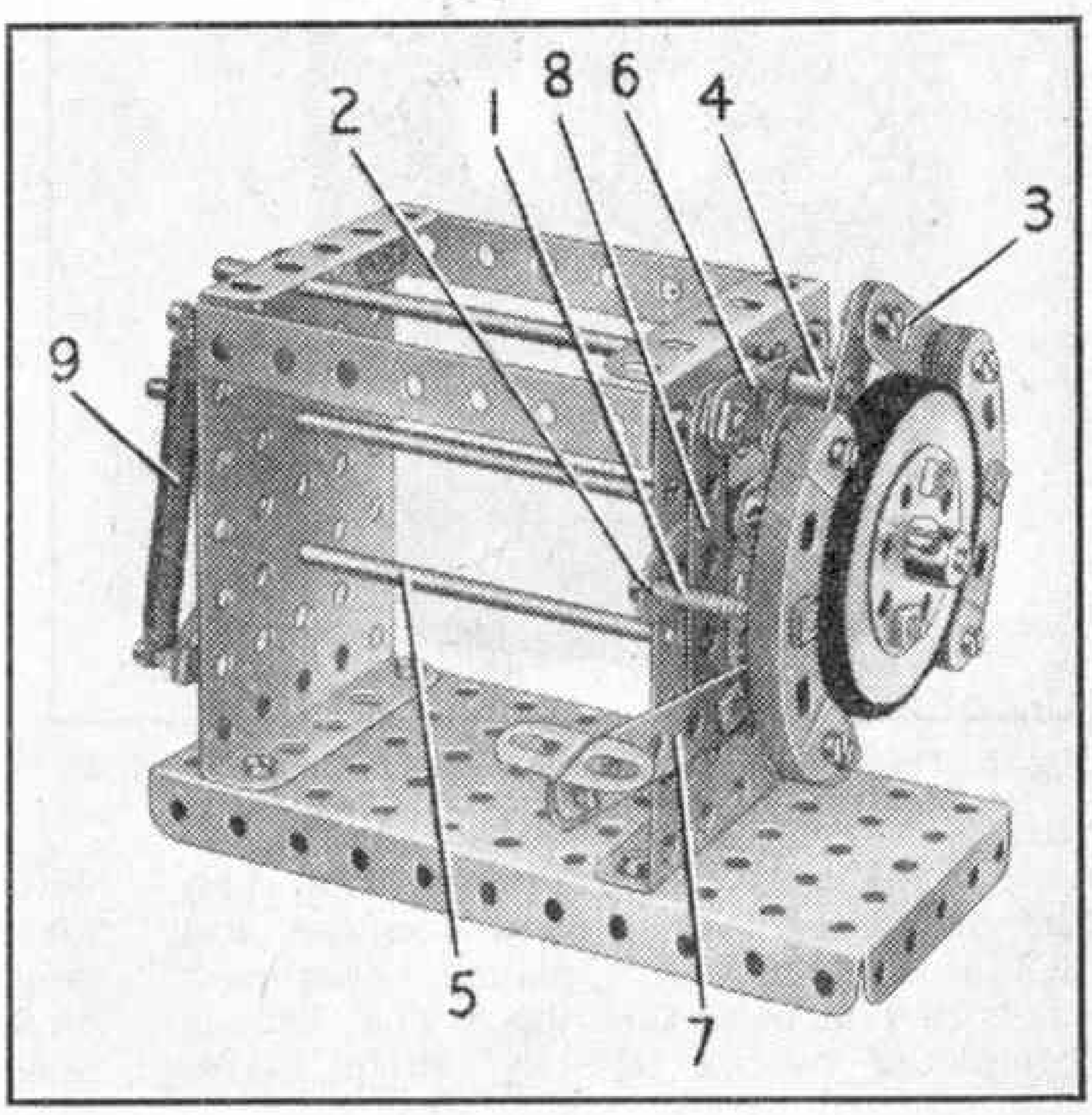


Fig. 4. Another view of the external contracting brake.

New Meccano Model

A Performing Conjurer

THE Meccano conjurer shown in Fig. 1 provides an excellent means of entertaining your friends at the Christmas party. The model is quite simple to build and when set in motion, the conjurer goes through the entire routine of performing a mystifying trick, in which a miniature playing card is made to disappear and reappear in a most magical manner!

The sides of the base of the model are made from 12½" Angle Girders joined at their ends by 3" Angle Girders, and filled in by 12½" × 2½" Strip Plates. The sides are bolted together to form a square, and a 12½" Angle Girder 1, flange uppermost, is bolted across the top. The top is completed by six 9½" × 2½" Strip Plates strengthened by 9½" Angle Girders 7.

Two 18½" Angle Girders 2 are bolted vertically to Angle Girder 1, and two 12½" Angle Girders 3 are fixed to its outer ends. Girders 2 and 3 are joined by a 12½" Angle Girder 4 and a 12½" Strip 5, and the space between Girders 2 and 3 on each side is filled by a 12½" Braced Girder. The framework formed by the Girders is completed by two 5½" × 3½" Flat Plates 6 and Curved Strips on each side.

The body of the conjurer is made from two 5½" × 2½" Flexible Plates bolted together, and curved at their outer edges to form a shallow U-shaped piece. An Angle Bracket is bolted to each side of the body in the third hole from the top, and these are fixed to the Strip 5. The legs are formed from five 5½" Strips. Two of these on each side are bolted to a 1" × ½" Angle Bracket at the top, and to a Double Bracket at their lower ends. The bolts holding the Strips to the Double Bracket hold also 1½" Strips that represent the foot. The legs are connected together by Double Brackets bolted between the feet, and the Double Brackets are then fixed to the base. A gap of approximately ½" is left between the body and the legs. The head is a 2" Pulley attached to a Fishplate bolted to the body.

A 3½" Rod is passed through the upper holes of the body and fitted with a Crank 8 extended by a 2½" Strip, and two Cranks 9 also extended by 2½" Strips. A balance weight of heavy parts is attached by Cord to the extension of Crank 8. A 3" Strip is fixed to each of the 2½" Strips extending Cranks 9, and a small piece of cloth is attached to the outer ends of the 3" Strips by bolts.

The model is operated by an E20R Electric Motor bolted to Girders 7 underneath the base. A ½" Pinion on the Motor shaft engages a 57-tooth Gear on a 3" Rod. This Rod is fitted also with a Worm, which meshes with a 57-tooth Gear on Rod 11. Bearings for Rod 11 are provided by two 1" × 1" Angle Brackets, one of which is bolted direct to the Motor, while the other is fixed to a 3" × 1½" Flat Plate forming an extension of the Motor side-plate.

A ¾" Pinion 12 on Rod 11 engages a 2½"

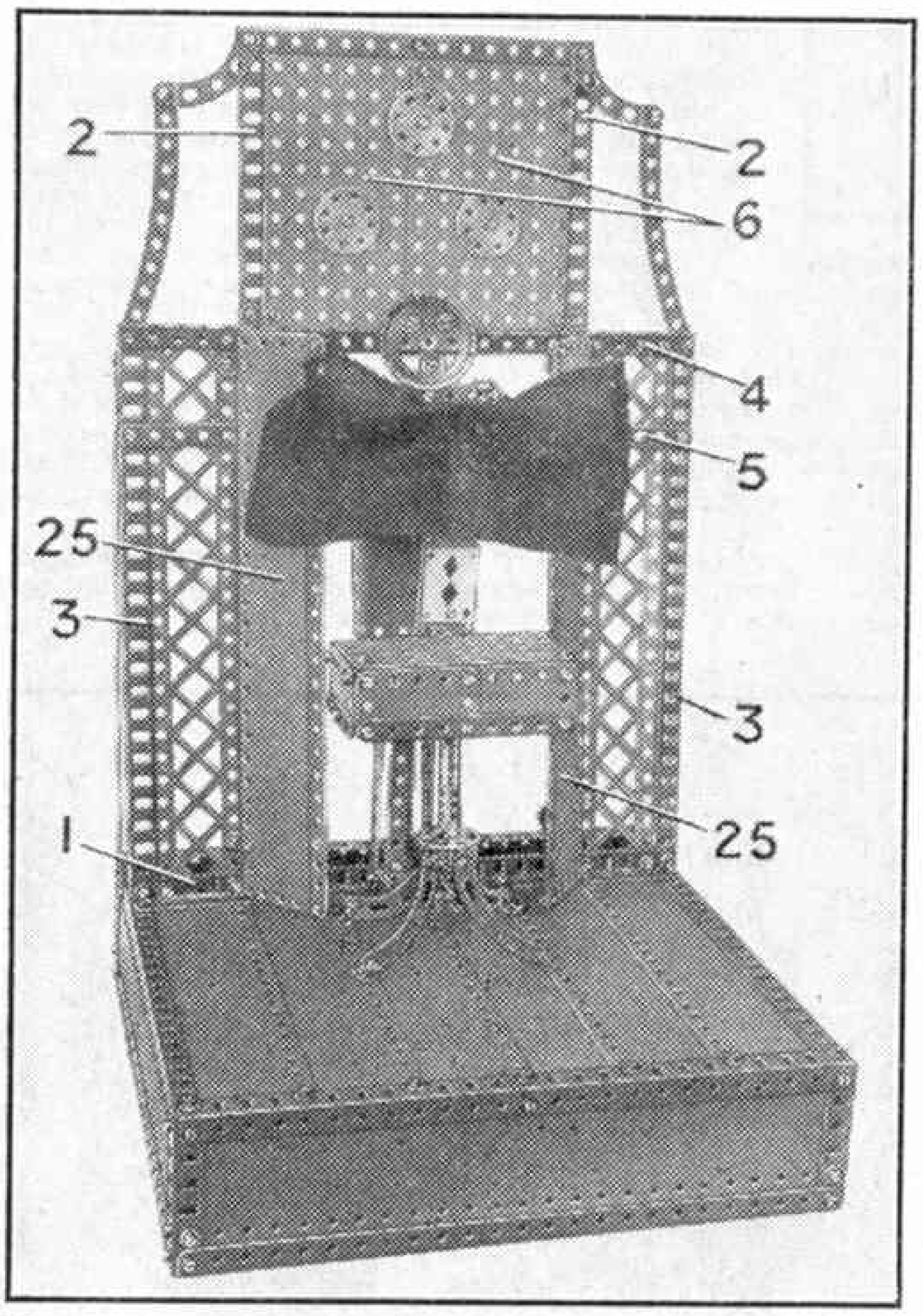


Fig. 1. The Meccano Conjurer described in these pages is an excellent fun provider for a Christmas Party.

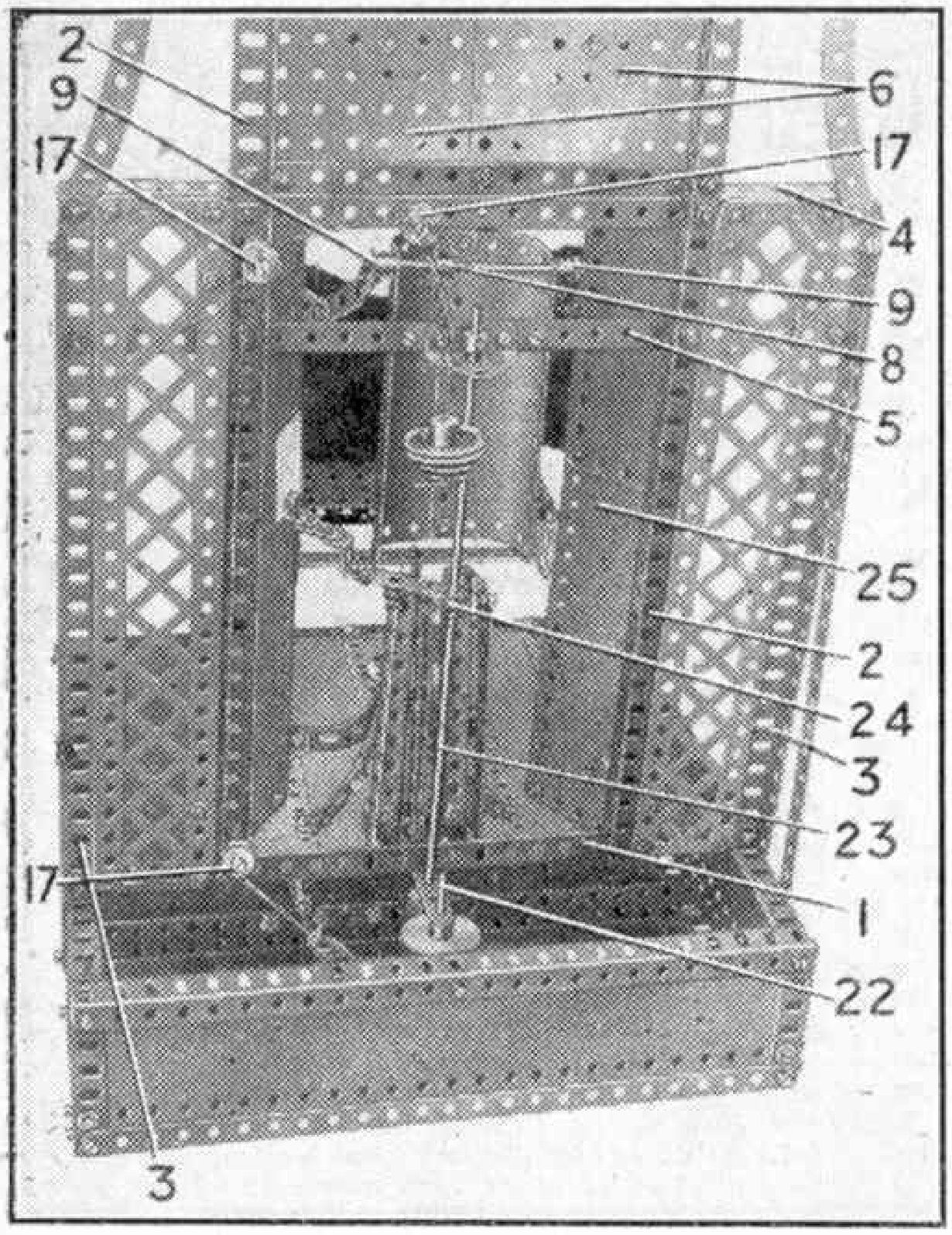


Fig. 2. The Conjurer seen from the rear.

Gear on Rod 13. This Rod is mounted in a Flat Trunnion bolted to a 12½″ Angle Girder 14, and it is connected by a Coupling to a Crankshaft 15. The Crankshaft is supported in a Flat Trunnion bolted to a 12½″ Angle Girder 16.

A piece of Cord is tied to a Fishplate loosely held between Spring Clips on the Crankshaft, and is taken over three ½″ loose Pulleys 17 and tied to the Crank 8. This arrangement raises and lowers the conjurer's arms as the Crankshaft is driven by the Motor. The ½″ loose Pulleys are mounted on 1⅛″ Bolts fixed by nuts to the framework.

A ¾″ Sprocket on Rod 13 is linked by Chain to a similar Sprocket on a Rod 18, which is mounted in Flat Trunnions bolted to Girder 14 and a similar Girder 19. The Rod 18 is fitted with a Double Arm Crank, that carries in its round hole a Threaded Pin 20. As the Crank turns the Threaded Pin contacts one of four other Threaded Pins fixed in a Bush Wheel 21, and thus rotates the Bush Wheel approximately a quarter turn for each revolution of Rod 18.

The Bush Wheel 21 is fixed on Rod 22, mounted in a 2″ Strip bolted to Girder 1 and in the 12½″ Angle Girder 16. This Rod carries also a 50-tooth Gear engaging a ¾″ Pinion on 11½″ Rod 23, which is fitted with a Crank 24 extended by a 1½″ Strip. A Reversed Angle Bracket is attached to the 1½″ Strip, and a Fishplate bolted to the Reversed Angle Bracket carries an Angle Bracket to which a playing card is fixed by a bolt.

The arrangement of the gearing ensures that during each complete cycle of the arm movement, the Crank 24 supporting the card makes half a turn. Thus when the arms and cloth are raised to disclose the card, the next movement results in the card swinging out of sight behind the figure, to re-appear after the next cycle.

Light pressure on Rod 23 is maintained by a Compression Spring held between a Collar and the Trunnion. This prevents the arm from swinging too far due to its own momentum. The wings 25 serve to conceal the swinging movement of the arm, and the angle at which they are placed should be adjusted to hide the mechanism effectively.

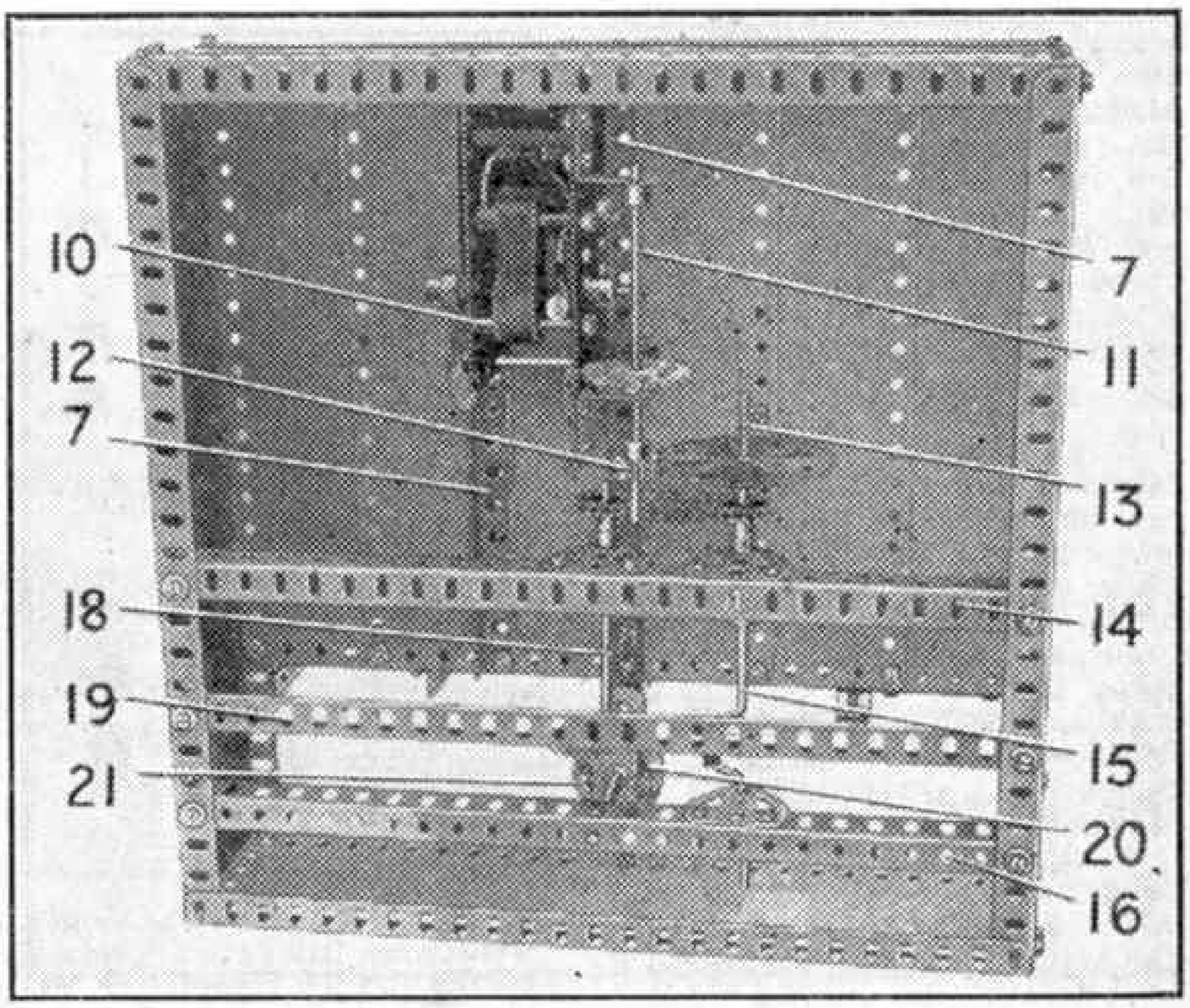


Fig. 3. An underneath view of the base of the Meccano Conjurer, showing the driving Motor and arrangement of the gearing.

Club and Branch News

WITH THE SECRETARY

CHRISTMAS WISHES

Every member of the Guild and of the H.R.C. is now looking forward to Christmas, the jolliest season of the year. Preparations for a really happy time are being completed in Clubs and Branches, and it will not be long before Social Evenings, Open Nights to which parents and friends are invited, and other special events are in full swing. I hope that every Club or Branch member will have the most delightful and enjoyable time, and my Christmas greetings are extended also to lone members of the Meccano Guild and of the H.R.C., in whatever part of the world they may be.

WELCOME FOR RECRUITS

Now is the time to look for new members. I have often emphasised this in previous years, but I am not sure that even yet sufficient is made of the opportunity for recruiting that Christmas brings with it. Normally a host of boys are introduced to Meccano and Hornby Trains at this time of the year. It is for Guild and H.R.C. members to give them a welcome and to help them to enjoy these hobbies to the full.

The best way of doing this is to invite them to come along to the meetings of Clubs or Branches, and to encourage them to become members of these happy throngs. Every member therefore should be asked to keep a lookout for friends or relatives who have become Meccano or Hornby Train owners for the first time, or have had their interest quickened by some timely additions to their Outfits, and then to take the necessary steps to bring them within the magic circle. The Christmas festivities give splendid opportunities for them to make friends with those who are already members.

MERIT MEDALLIONS

This month we come to the end of the last Session of 1951, and I wish to remind all Leaders that their nominations for Merit Medallions should not be long delayed. Two Merit Medallions are available for each Session in each Meccano Club, and if I receive nominations in good time I can send out the Medallions in readiness for presentation at one of the special Christmas meetings.

CLUB NOTES

BURY GRAMMAR SCHOOL M.C.—Meetings are held weekly. The Session began with an Open Night, when old and new members were given details of the programme. Model-building Competitions have been held, the subject of the first being a crane. This brought out excellent entries. Club roll: 20. *Secretary:* John A. Strafford, 13, Maple Grove, Prestwich, Nr. Manchester.

ONLLWYN Y.M.C.A. M.C.—A start was made this Session with the construction of models from the Manuals. It has been decided to organise an Annual Model-Building Contest, and it is hoped to obtain a shield as a trophy for the winner. Club roll: 12. *Secretary:* Lynn Watkins, Duffryn Cellwen, Onllwyn, Nr. Neath, Glam.

THORNTON GRAMMAR SCHOOL M.C.—Meetings have attracted larger attendances, including new members. In addition to Model-building the proceedings have included a Film Show, and the activities of the Train Spotting and Gardening Sections and the Stamp Club. Club roll: 24. *Secretary:* B. W. Harrison, 122, The Avenue, Clayton, Bradford, Yorkshire.

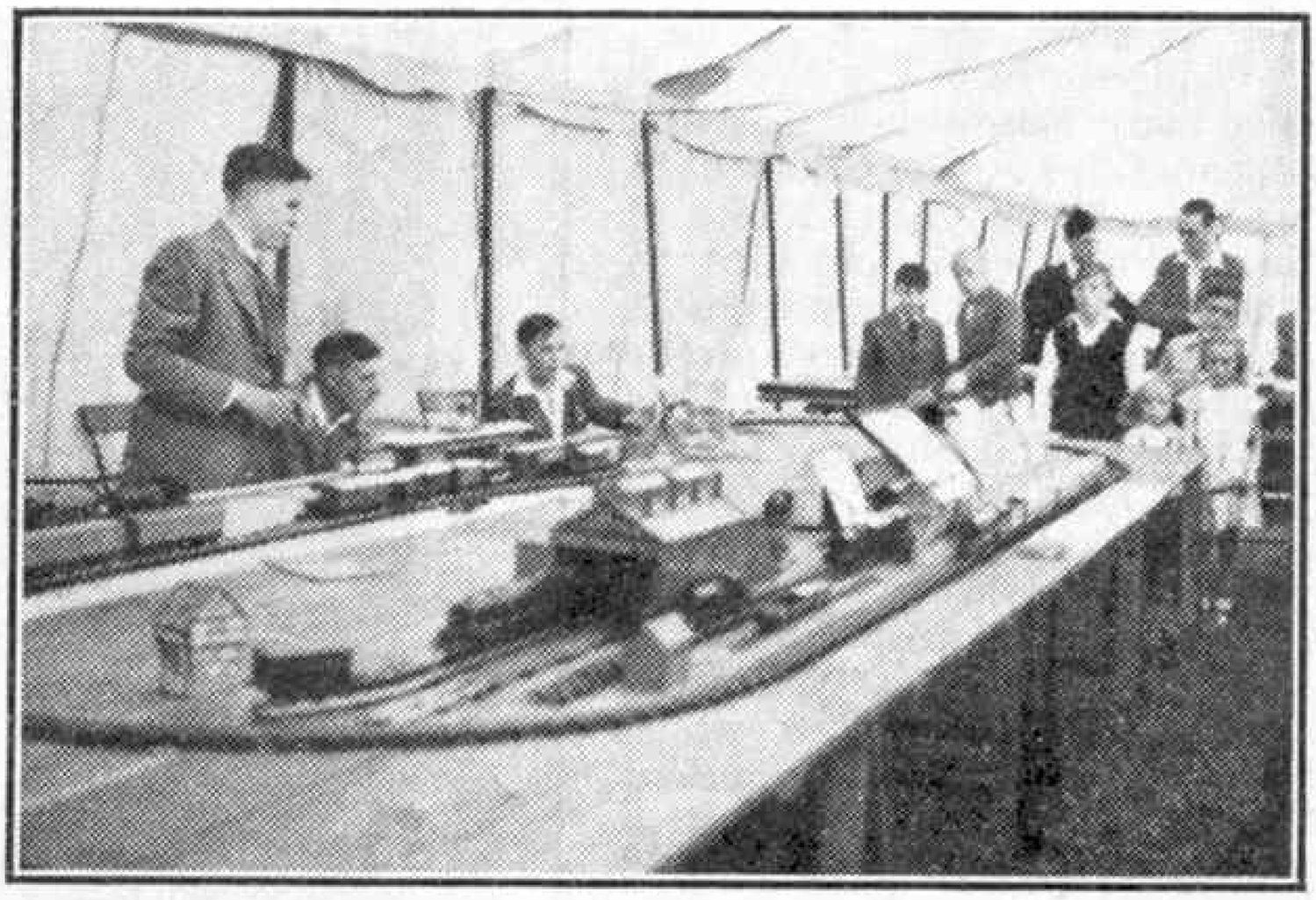
SOUTH AFRICA

MALVERN (JOHANNESBURG) M.C.—Members worked hard making models for display at the Johannesburg Y.M.C.A. Fête. Visits have been paid to a bakery and to the South African Broadcasting Corporation's Studios and Recording Rooms. Teams known as the "Rangers" and the "Rovers" have been formed. Points awarded to members count as team marks, and prizes based on these will be awarded periodically. Club roll: 20. *Secretary:* Miss Jean Weaver, P.O. Box 8, Cleveland, Johannesburg, South Africa.

BRANCH NEWS

HIGH CRAIGIE (PERTH)—General meetings have continued. Talks are popular, especially with older members. Five of the original members of the Branch were present at the 50th meeting since incorporation was granted. A railway drawing contest has been held. Outdoor layouts have been built up and operated by groups of members, each taking an official position and working to timetable. *Secretary:* J. Duncan, "Dunrae," 41, Evelyn Terrace, Craigie, Perth.

RYDAL SCHOOL—The sinking of the main tunnel of the Branch layout made necessary a complete re-building. Other constructional work has been carried out, including the improvement of sidings and the repair of unsatisfactory points. A visit to the Works of Meccano Ltd. was the brightest feature of the recent programme. *Secretary:* Roy L. Paton, "Barbarians," Rydal School, Colwyn Bay.



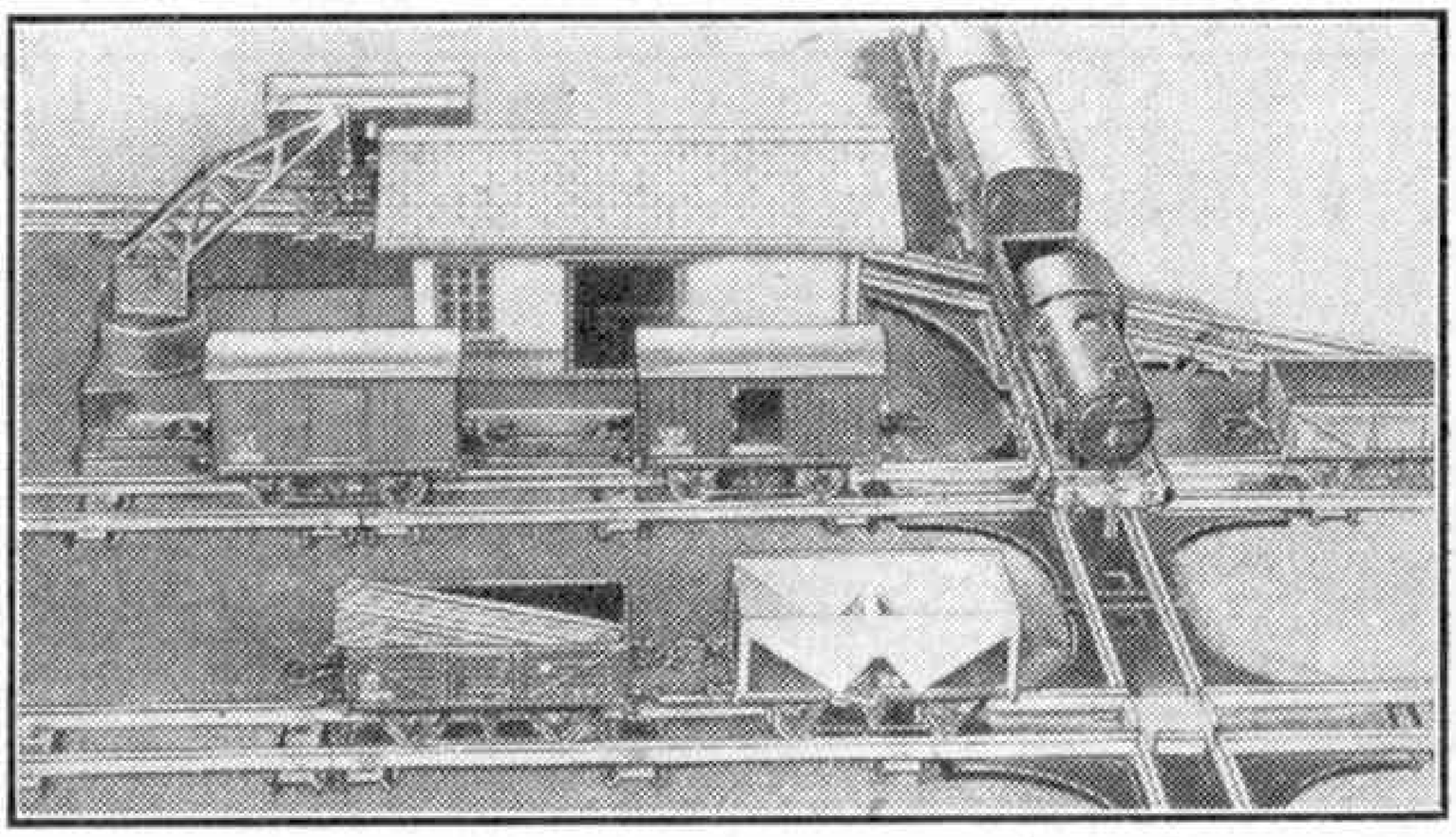
An interesting scene on Chingford Day, when the New Road (South Chingford) Branch No. 510 gave a special display. On the left, watching a train running on the Branch layout, are Mr. K. R. White, Secretary of the Branch, and Mr. G. C. Flowers, Chairman. This fine Branch was incorporated with the H.R.C. in 1948, and now has extensive Hornby and Hornby-Dublo layouts, on which operations are carried out with skill and delight.

Hornby Track and Layout Topics

A NOTABLE feature of Hornby track is its adaptability. As readers know, the various sections, Curved Rails, Straight Rails, Points and Crossings, can be used to form a wide variety of layouts. Proof of this is given by the many diagrams in the booklet *"Layouts for Clockwork Track"* that is included in all Hornby Train Sets from the M1 upward, and these represent layouts that can be extended or modified according to the requirements of the individual Gauge O railway engineer.

Most Hornby railway owners like to try out many different layouts, even if it is their intention ultimately to erect a permanent system, for by doing so they gain useful experience. In many cases lack of space makes the portable type of railway almost a necessity, but as long as sufficient rails are to hand trying different schemes provides plenty of fun. Again two or more Hornby enthusiasts may get together with their equipment to form a single system. Some interesting effects are to be obtained in this way. For instance, Points, Crossings and other components may be combined in an unusual manner for special requirements.

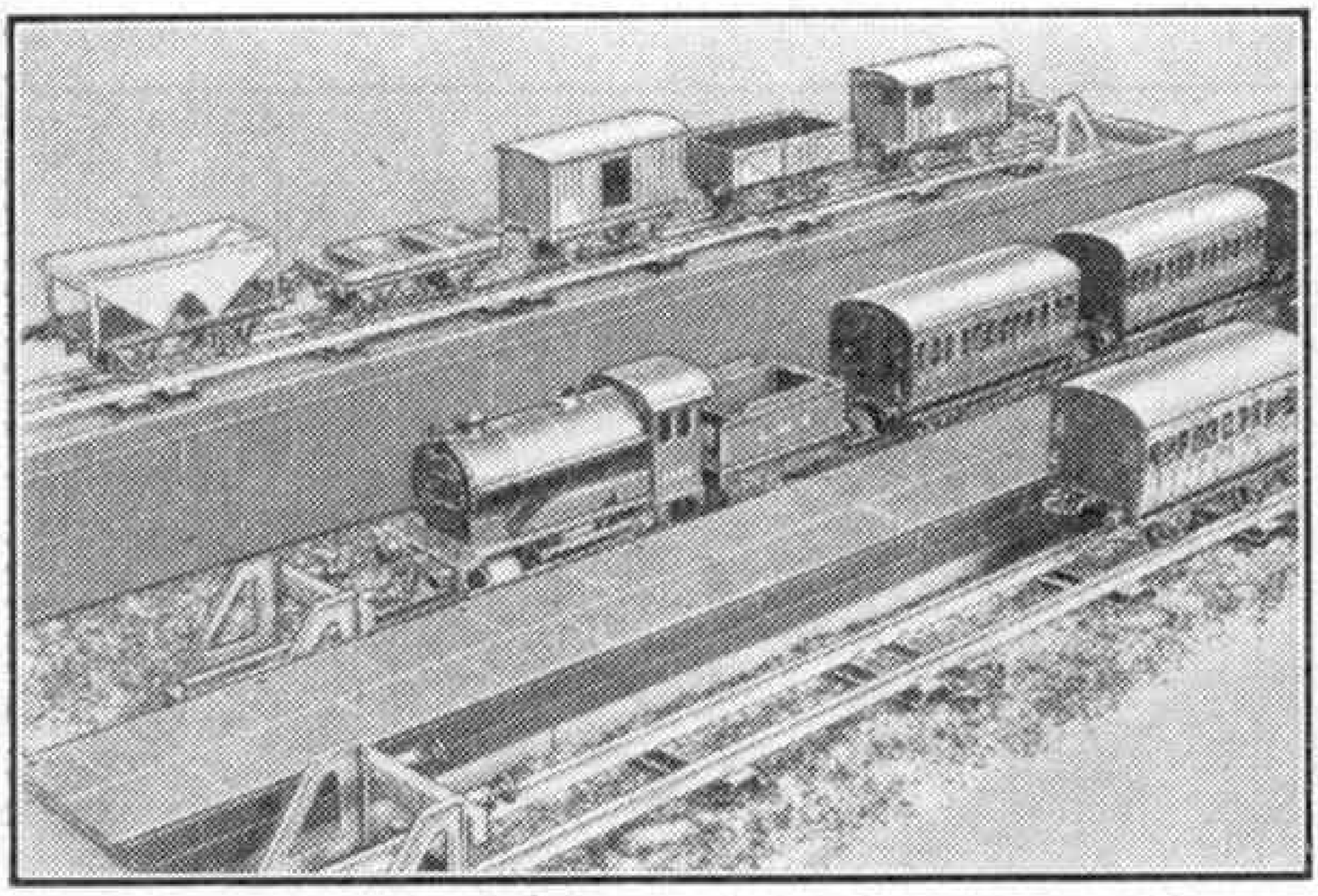
The upper photograph on this page is an example of this sort of thing. On it is seen a freight yard, with several tracks parallel to one another, and these are crossed at right angles by a running line.



An unusual layout incorporating Hornby Acute Angle and Right Angle Crossings. Layouts of this kind are sometimes found in yards and dock premises

This type of layout is unusual, but might be used in connection with a marine terminal of the kind suggested in the Hornby Railway article in the October "M.M." Its principal interest will be found in the making up of trains and in separating them again according to the traffic they are supposed to carry. At the same time the actual transhipment of loads can be practised.

Passenger terminal schemes are usually found in connection with non-continuous layouts, but these require more complete terminal arrangements than are usually found at miniature stations. Arriving engines often have to be able to run round their trains, or to dispose of them, and this means loop lines and sidings of sufficient length in the right places. Alternatively, spare engines can be available to take arriving trains out again and then running round loops are not necessary.

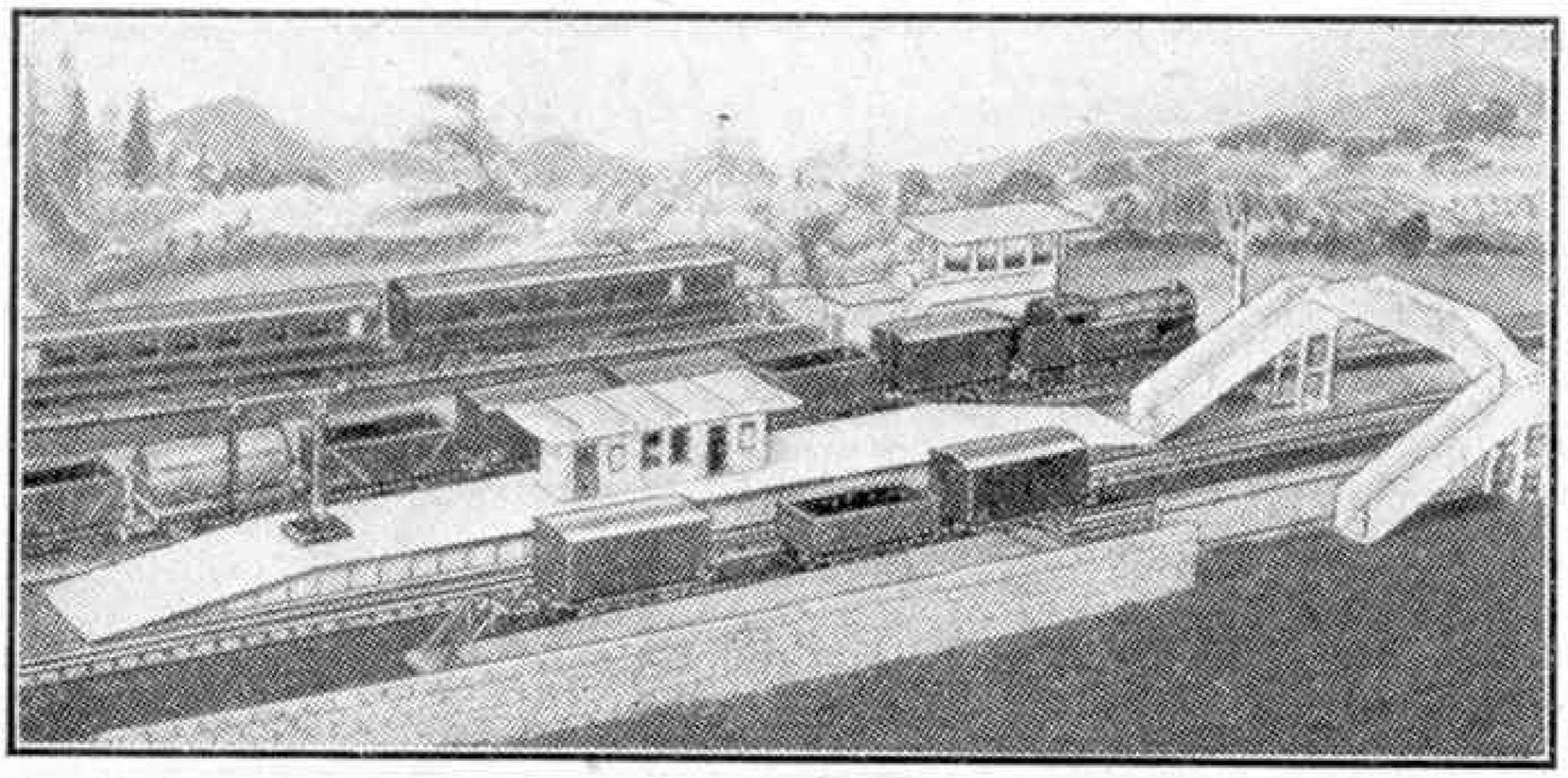


A stopping train on a Hornby layout at the terminal Buffer Stops. Note the goods vehicles on the elevated track in the background.

More Hornby-Dublo Station Schemes

IN the October *"M.M."* this year we considered various station schemes for Hornby-Dublo layouts. Schemes of this kind are of never-ending interest, and here are more ideas for the enthusiast in search of realism and variety.

The upper illustration herewith shows a Hornby-Dublo Island Platform used, as intended, between two tracks. When it is placed on its own in such a situation it is liable to give the impression that it is rather an isolated structure surrounded by railway. Therefore in order to make contact with the "outside world" the Hornby-Dublo Footbridge can be used as shown in the picture. There it leads off from platform end, spans the inner track and then comes down outside the boundary wall. One is so accustomed to seeing the Footbridge spanning a double track and connecting the two platforms of a station that it makes an interesting change to place the Footbridge as suggested.



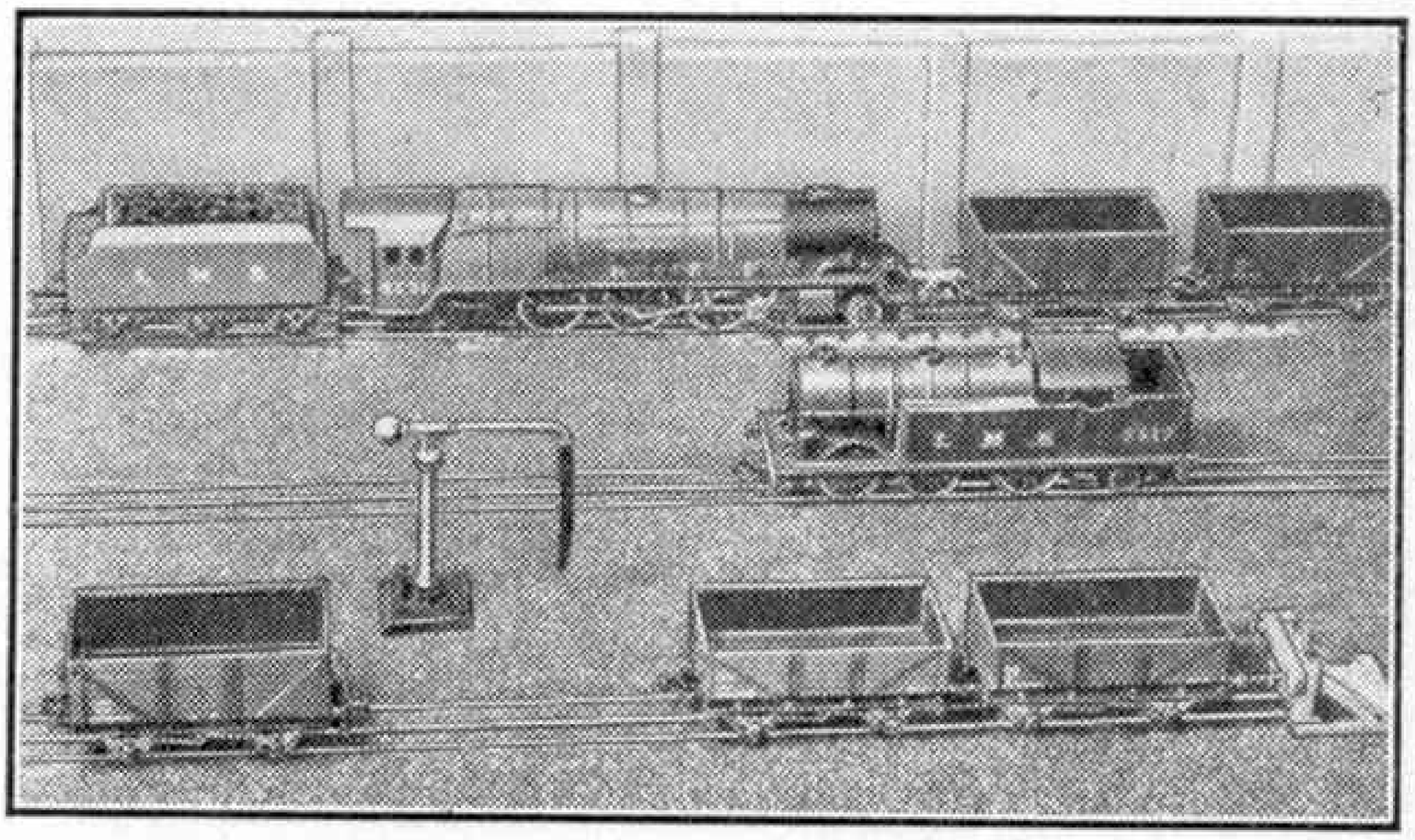
A mixed goods train in charge of a Hornby-Dublo Tank Locomotive passing an Island Platform. Note the effective use of the Footbridge.

Another piece of equipment that can be used effectively in a station scheme is the Hornby-Dublo Water Crane. Its exact position in relation to the station platform will depend on where the engines usually stop. It can stand on the platform itself or, if the engines normally stop just beyond the platform, a better position will be on the "ground" at the end of the sloping ramp.

The swinging arm of the Water Crane should remain parallel to the track when the Crane is not in use. To ensure that the arm does not move unnecessarily, the top of the column has a couple of ridges cast on it that register with corresponding depressions on the revolving part of the arm. Care should be taken therefore to see that the column is placed the right way round on the layout.

Apart from station uses the Water Crane should also be found in the goods yard or alongside any track where locomotives stand. In addition, the locomotive yard itself requires one or more such Cranes according to its layout and capacity. Sometimes it is possible to place a Water Crane between the two tracks, so that it can serve locomotives standing on either of them.

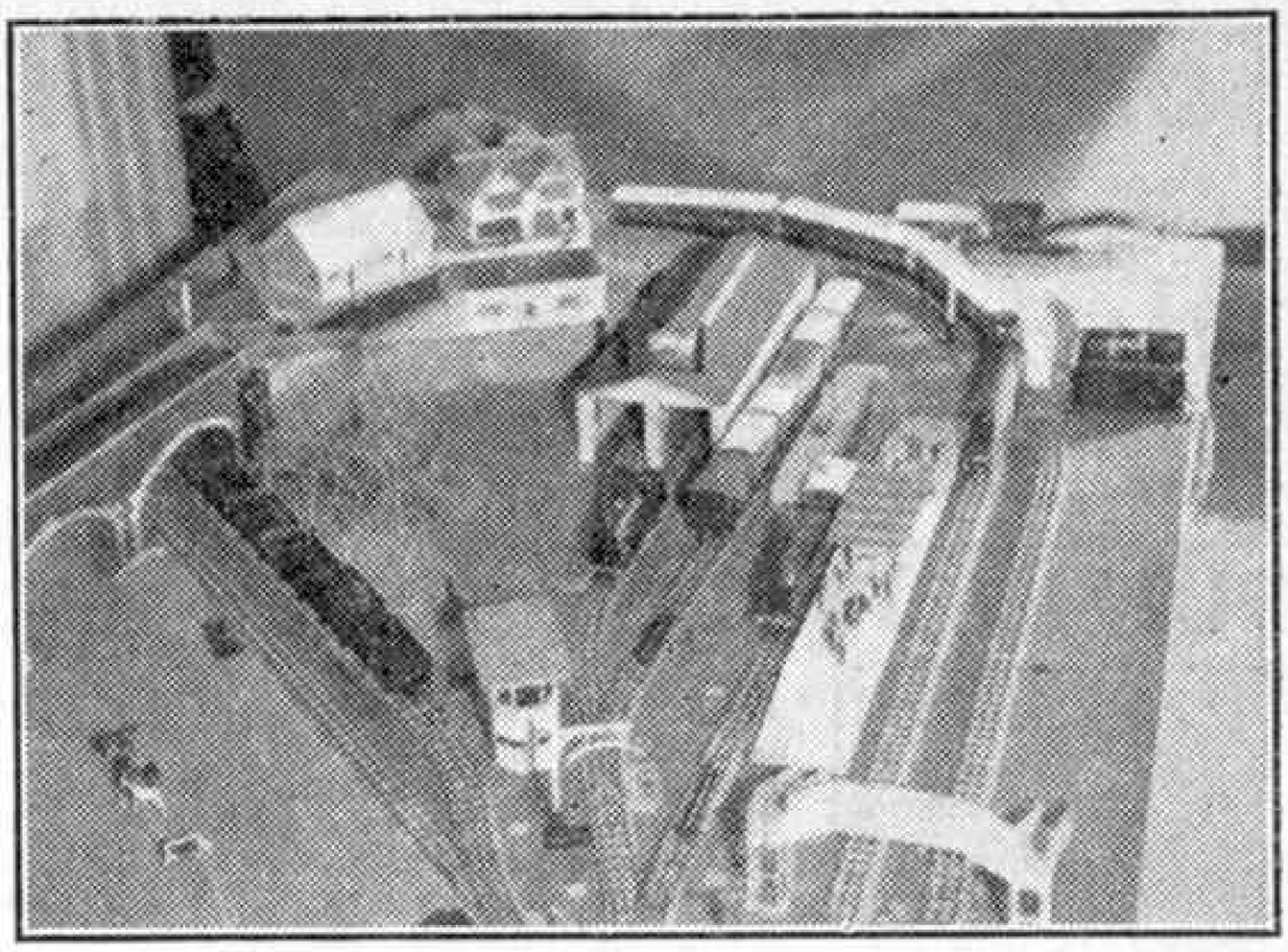
An accessory that is of special importance when goods yards are being considered is the Loading Gauge. This is usually found near the goods warehouse or loading bank in actual practice.



Hornby-Dublo locomotives "at home." The Water Crane is necessary in locomotive yards and elsewhere in the layout.

A Hornby-Dublo Layout in Canada

THE neat and effective Hornby-Dublo layout shown in the accompanying pictures is a joint effort on the part of two enthusiastic "*M.M.*" readers and H.R.C. members, Mr. Charles M. Hare, Ottawa, and his son. The system, still in course of development, is arranged on a baseboard 7 ft. by 3 ft. 7 in. It is a portable layout in a sense, for when the railway is not in use the various buildings and certain other structures are lifted off and the board, complete with track and wiring, then stands on end behind the door of the room.



General view of the Hornby-Dublo layout of Mr. Charles M. Hare, Ottawa, showing the Island Platform, engine shed and sidings. Photographs by Mr. Fred Blakeney.

The main line is continuous and follows the usual oval form. For part of its length two tracks are available, but the remainder of the layout, except for a running loop, is single-track. Connecting the two longer sides of the oval is a diagonal track that is useful as an alternative route and for reversing purposes. From this there are taken off several goods sidings, a dead-end platform road and a track leading to the locomotive yard and shed.

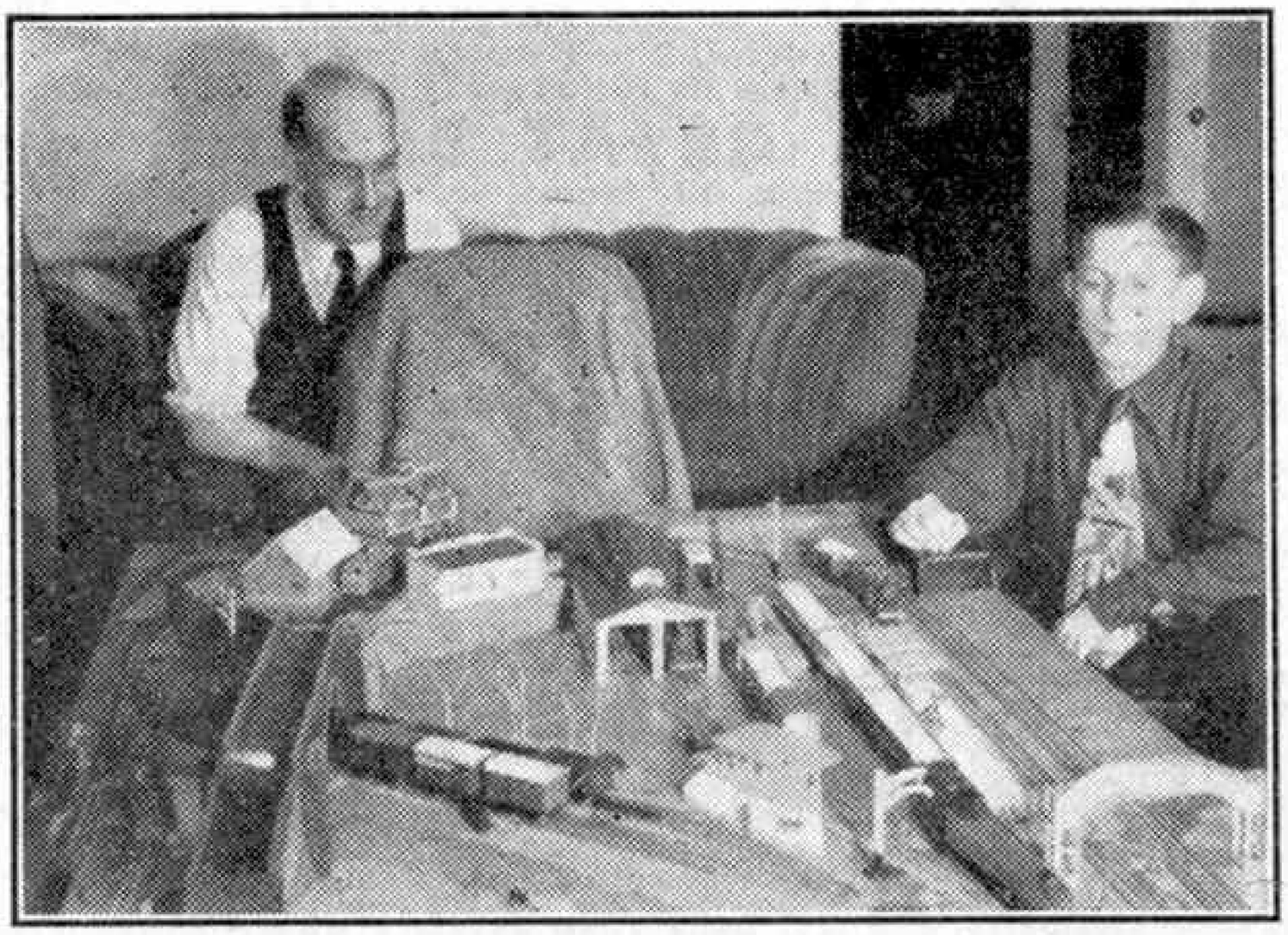
A Hornby-Dublo Island Platform forms the principal station, which lies between the inner main line on the double track section and the platform road just mentioned. It is planned to add a further station platform outside the double track, and a footbridge to connect the two sides of the complete station thus formed is already in position. Opposite to the loop line previously referred to is a small halt.

The line is worked by means of two Controllers and is divided into six main sections. Power can be fed from either Controller to any selected main section through special switches. Four of these main sections incorporate sidings, each of which can be isolated separately, if necessary.

Express traffic is worked by a Hornby-Dublo "*Sir Nigel Gresley*" locomotive and L.N.E.R. stock. The goods vehicles, as usual, are of various kinds, and there are two Hornby-Dublo tank locomotives for general mixed traffic duties on the line.

Safety in working is ensured by the inclusion in the track of insulated sections at the trailing ends of points, the sections being made "live" or "dead" according to the setting of the points.

Special attention has been given to lineside structures, apart from those of definitely railway character. An interesting double-arched road bridge carries a miniature road over the railway and a "river."



Mr. Hare and his son enjoying operations on the Hornby-Dublo layout described on this page.

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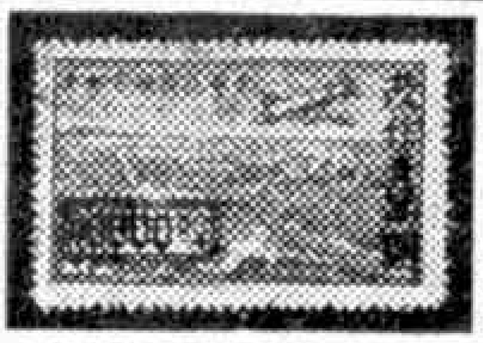

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For other Stamp Advertisements see also pages 568 and xvi.

Stamp Collecting

Pakistan's Attractive Issue

By F. Riley, B.Sc.

WHEN Pakistan's new stamps appeared during August last, in celebration of the fourth anniversary of independence, a complete set was very kindly sent to me by my friend Mr. E. R. Kooka, of Bombay, who has long been a regular reader of the "*M.M.*" When I opened the packet and saw the eight stamps in this issue I thought they were very attractive indeed. They are beautifully printed and the colours are excellent.

I liked the stamps even more when I began to examine their details. Their designs are full of Eastern symbolism, and indeed have what has been described as an Arabian Nights air about them. There are four in the set, the stamps being arranged for this purpose in pairs, and these are the work of the noted Pakistan artist, K. B. Abdur Rahman Chughtai. They are recess printed, by the well-known British stamp printers Thomas de la Rue and Co. Ltd., London, and each is in one colour. The perforations are 13 throughout.

The four designs are illustrated on this page, and even in black and white it can be seen how pleasing they are. The lowest value of 2½a. has the same design as the 3½a., which is pictured in this column, the colours being carmine and blue respectively. The central features are a vase and a plate. The production of artistic pottery has long been traditional in Pakistan, and indeed in the Moslem world, and the design can be taken as a recognition of this, and also as a representation of the interest of Pakistan in the revival of this traditional and decorative work. The vase and plate are surrounded by a leaf decorative design, which again is typical of Moslem art.

The next pair to be considered are the 3a. and 12a. values. The colour of the former is maroon, while the 12a. stamp is a greenish blue that is best described perhaps as slate. Here we have an interesting contrast. The two values are intended for air mail use, internal and external, and so the design includes an aeroplane, obviously a speedy one, which typifies the modern age. On the other hand there is an hour glass, an ancient means of measuring the passage of time. Perhaps its purpose is to suggest the saving of time that the use of aircraft has made possible. The "sky" that forms the appropriate background for the aeroplane carries the Moslem Crescent, with the Star between its horns.

The 4a. and 6a. values are distinguished by a Saracenic leaf pattern. We have already met a leaf pattern on the 2½a. and 3½a. values, and here is a delightful example that in this instance forms the outstanding feature of the design. The leaf pattern has been used for centuries in Moslem art, in which it has become traditional, and it has long been the chief feature of architectural decoration in the Moslem world. It is a speciality of the artist who designed the stamps, and the pattern he has produced is very attractive. The Moslem Star also is a feature of the design, set above what appears to be a modified Crescent in which the horns meet. Of this pair of stamps the 4a. is leafy green in colour and 6a. autumnal brown.

This brings us to the final pair, the 8a. in dark brown and the 10a. in violet. The design again is characteristically Moslem in character. A glance at the reproduction of the 10a. value at the head of this column reveals the symbolic arch that is characteristic of Moslem architecture. Within it we have the Crescent and Star, the former with its horns practically touching, together with a hanging lamp of a shape that is familiar throughout the Moslem world. This symbolises the "lamp of learning" lighted by the Moslems in the world "after the darkness of the Feudal ages."

All the stamps have the indications of their value in English as well as in Eastern characters. Also included in the designs is the Oriental inscription that is to be found on earlier Pakistan stamps. Presumably this gives the name of the country of issue, which also is stated on the stamp in its English form. The inscription can be seen on the 3a. value of the August 1948 issue of Pakistan reproduced on this page. That issue was a pictorial one, and the design of this stamp illustrates the airport at Karachi.

I have mounted these stamps on a page of my album and I turn to this from time to time in order to enjoy the designs and the general attractions of the stamps themselves. The set is certainly the best that Pakistan has yet produced. Previous issues have included one or two efforts at Moslem symbolism, but for the most part the stamps, while of the greatest interest, have been of the pictorial type and have not been particularly inspiring. The 1r. value of the Independence issue of 1948 is a notable exception.

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For other Stamp Advertisements see also pages 566 and xvi.

Stamp Gossip

and Notes on New Issues

By F. E. Metcalfe

THOUGH the British Commonwealth turns out many new stamps, few of these can be as interesting as the "Health" issue of Fiji, which appeared on 17th September, and none is more worthy of support. The writer of these notes recently had a long talk with someone who had lived for many years in Suva, the capital of this far away colony. He had much to say about the loyalty of its dusky inhabitants. Apparently all have a fervent wish that when Princess Elizabeth and the Duke of Edinburgh visit the Antipodes they may find time to call and say how do you do.

What are these "Health" stamps in aid of, you may ask. The surcharge on them is to provide funds for tubercular patients. Alas, there are quite a few of them in Fiji, and practically all are soldiers who contracted the malady while fighting overseas, for us. Hence the good cause mentioned above.

It is said that 570,000 sets were issued, and while these notes are being written sometime before they appear in print, there is already news that the entire emission has been sold out. And it should be added that those who bought at new issue rates will indeed have made a bargain. The first "Health" stamp of New Zealand, which appeared in 1929, sold at the time for 3d. Yet to-day a copy costs about 15/- and many more were printed of that stamp than have been printed of the Fiji one.

It is amazing how the popularity of these "Health" stamps has grown. The first one that New Zealand issued sold to the tune of only 592,848 copies, but the pair that came out last year attracted collectors to the number of 5,521,324 for the low value, and 6,816,448 for the higher one. A tidy sum indeed was thus realised, yet collectors would not begrudge a penny of it, and it's a pity that more were not issued in Fiji. Here's hoping that next year Fiji will issue 10 million, and may they all sell.

Readers will remember that in April of this year the stamps of the Somaliland Protectorate were issued with a surcharge in East African currency. On 1st October the stamps of Aden and the two Aden States appeared similarly treated, so now all British Territories in this region have such a simplified currency—100 cents make 1 shilling—that even visiting Americans will be able to sort out their change. Incidentally the 8a. of Aden itself has been surcharged both 30c. and 50c., so if you come across either, please don't think that you have come across a rare error, as did so many people when the colours of our own stamps were changed last May. Dealers then had a terrible time informing all and sundry that their penny stamps printed in blue were not rarities worth hundreds of pounds.

Mention was made last month about the St. Helena set, which is being overprinted for "use" in Tristan da Cunha. What collectors want to know is how a 10/- can be used even if all the island's visible exports are made up into one parcel. Rumour has it that hitherto Tristan's currency has consisted of potatoes, but apparently the authorities have decided that stamps of "2 spuds" denomination, etc., would not be quite the thing. In the meantime it can be said in advance that such an obvious raid on collector's pockets will be a flop; few will sell after the new issue services have obtained their supplies.

It is a bit since I gave a tip, and here I think is a good one. Nyasaland brought out a rather attractive set of commemorative stamps on 15th May and the stamps became obsolete on 14th August. Now it is a fact that as it was summer, the stamps slipped out before even the dealers on the whole noticed. There is a deal of quiet buying going on, when the stamps can be found, but that is the point. They are not being found in any quantity, hence the tip. Just hang on to your set; you will be glad later that you did so.

There has been a lot of discussion recently about stamp designs, and one of the reasons given why there have been so many failures amongst British stamps issued during the past few years is that designers are hedged around by far too many conditions. A country that is turning out some beautiful stamps in these days is Japan. Not all are attractive by any means, but the air set recently issued is a striking proof of how effective a quite simple motif can be if handled by a real artist. Just examine the illustration, and it will then be obvious what can be done by one who understands the medium in which he is working.

From time to time the writer of these notes is asked by a reader which is a good country to collect. Of course, it all depends on the philatelic knowledge of a would-be collector, and on the depth of his pocket, as to which country will be best. Recently a letter was received from one who stated that he would be able to spend about a pound a month, and that he wanted a not too difficult country that had attractive stamps. Well, an ideal country for such a collector is Iceland. This country has produced some very beautiful issues, but has never exploited collectors, and a really nice show can be got together for a modest sum. There will be no difficulty in keeping such a collection up to date, for whenever Iceland brings out a new set of stamps, it is always possible for a collector to buy at ordinary current rates. Yes, this tight little island always issues its stamps in a straightforward manner.

And by the way, just to show that our own country can produce handsome stamps for others, a current stamp of Iceland produced in Great Britain is being used for our third illustration. The fourth shows the overprinted St. Vincent stamp celebrating the new constitution of this British West Indies island.

Competitions! Open To All Readers

Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

What Cars Are These?

Car Faces

As it is a long time since we had a Car Faces competition we are giving readers another opportunity of proving that they can recognise up-to-date cars by them. On this page are illustrations showing the fronts of 10 modern British cars. Readers are asked to make a list of these in order, giving with each number the name of the car that it represents. Enough to identify the model completely is required.

Prizes of 21/–, 15/– and 10/6 will be awarded to competitors who send in the best entries in order of merit. There will be a section for overseas readers, with prizes of the same value, and consolation prizes also will be awarded in both sections. Entries must be addressed *"Car Faces Contest, Meccano Magazine, Binns Road, Liverpool 13."* Closing dates: Home, 31st January, 1952; Overseas, 30th April, 1952.

December Photographic Contest

The twelfth of our 1951 series of photographic contests is a general one in which we invite readers to submit prints of any subject. Each competitor may submit only one photograph, which must have been taken by him, and on the back of his print must be stated exactly what the photograph represents.

The competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections, and in each section prizes of 21/–, 15/– and 10/6 will be awarded. Entries should be addressed: *"December Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13."* Closing dates: Home Section, 31st December; Overseas Section, 31st March, 1952.

Competition Results and Solution

HOME

JULY 1951 PHOTOGRAPHIC CONTEST

1st Prize, Section A: T. McCleary, Belfast; Section B: G. D. Temperley, Cudworth. 2nd Prize, Section A: G.Ogilvie, Edinburgh 4; Section B: J. R. Apps, Luton. 3rd Prize, Section A: E. G. Roughton, Upminster; Section B: P. G. Rose, Wigan. Consolation Prizes, Section A: H. North, Nottingham; J. E. Turley, Tunbridge Wells; B. Thomson, Sherwood; P. A. Spring, Bramhall. Section B: B. P. Knight, Bedling; N. Reynolds, Sidcup; M. Robinson, Harrow; P. Clifford, Wembley; P. B. Browning, Edinburgh 10.

JULY 1951 COMMERCIAL VEHICLES NAMES CONTEST

1st Prize: I. Rose, Glasgow W.3. 2nd Prize: C. J. Rayner, Maidstone. 3rd Prize: D. W. Blacklock, Cockermouth. Consolation Prizes: J. R. Hill, Stone; P. Hatcher, Tunbridge Wells; D. Richmond, Cheadle Hulme; C. D. Goodman, Harrogate.

JULY 1951 LOCOMOTIVE CONTEST

1st Prize: J. Ward, Warrington. 2nd Prize: W. A. Hopkins, Southsea. 3rd Prize: P. Hanneman, Edgeware. Consolation Prizes: R. R. Bradley, Ashbourne; P. C. Williams, Keswick; D. Gardner, Buxton.

AUGUST 1951 PHOTOGRAPHIC CONTEST

1st Prize, Section A: P. R. J. Vickers, Newcastle-on-Tyne; Section B: M. E. Ware, Woodbury. 2nd Prize, Section A: H. A. Whitley, Kidderminster; Section B: B. J. Oliver, Wembley. 3rd Prize, Section A: R. P. Sykes, Birmingham 20; Section B: B. P. Moult, Derby. Consolation Prizes, Section A: E. Bruce, Ashstead; F. Ashley, East Kirkby; P. Clifton, Derby; Section B: D. F. Saunders, Cirencester; R. H. Morling, Lowestoft; J. Humberstone, London N.10.

OVERSEAS

MARCH 1951 PHOTOGRAPHIC CONTEST

1st Prize, Section A: B. Cross, Nice, France; Section B: G. Schwegmann, Rondebosch, S. Africa. 2nd Prize, Section A: D. A. Thornton, Roberval, Canada; Section B: L. C. Johnson, Bergen, Norway. 3rd Prize, Section A: A. Williams, Boulogne, France; Section B: P. T. Melia, Aarhuus, Denmark. Consolation Prizes: L. F. Jones, Durban, S. Africa; P. V. Hughes, Cunderdin, Australia; T. Flower, Moltema, Australia.

APRIL 1951 DOUBLETS CONTEST

1st Prize: G. Borg-Myatt, Pawla, Malta, G.C. 2nd Prize: P. K. Dubash, Bombay, India. 3rd Prize: T. Miles, Riverton, N.Z. Consolation Prizes: R. J. Tyler, Bombay, India; J. C. Moore, Portland, Canada; B. Perry, Grenada, B.W.I.

APRIL 1951 LOCOMOTIVE CONTEST

1st Prize: C. Barry, Rockhampton, Australia. 2nd Prize: M. Z. Potts, Bombay, India. 3rd Prize: K. A. McPherson, Alexandria, Egypt. Consolation Prizes: G. Peters, Singapore, Malaya; V. Johnson, Dublin, Irish Republic.

APRIL 1951 PHOTOGRAPHIC CONTEST

1st Prize, Section A: T. D. Bennett, Rotterdam, Holland; Section B: H. Falconar, Quebec, Canada. 2nd Prize, Section A: M. C. Mills, Bahia, Brazil; Section B: S. Richards, Ohio, U.S.A. 3rd Prize, Section A: H. Arnold, Dublin, Irish Republic; Section B: K. Power, Santiago, Chile. Consolation Prizes: D. Rice, Newry, Irish Republic; R. D. Poole, Waterford, Irish Republic; I. Moreland, Greymouth, N.Z.; R. Leahy, Melbourne; J. Skelton, Yarram, Australia.

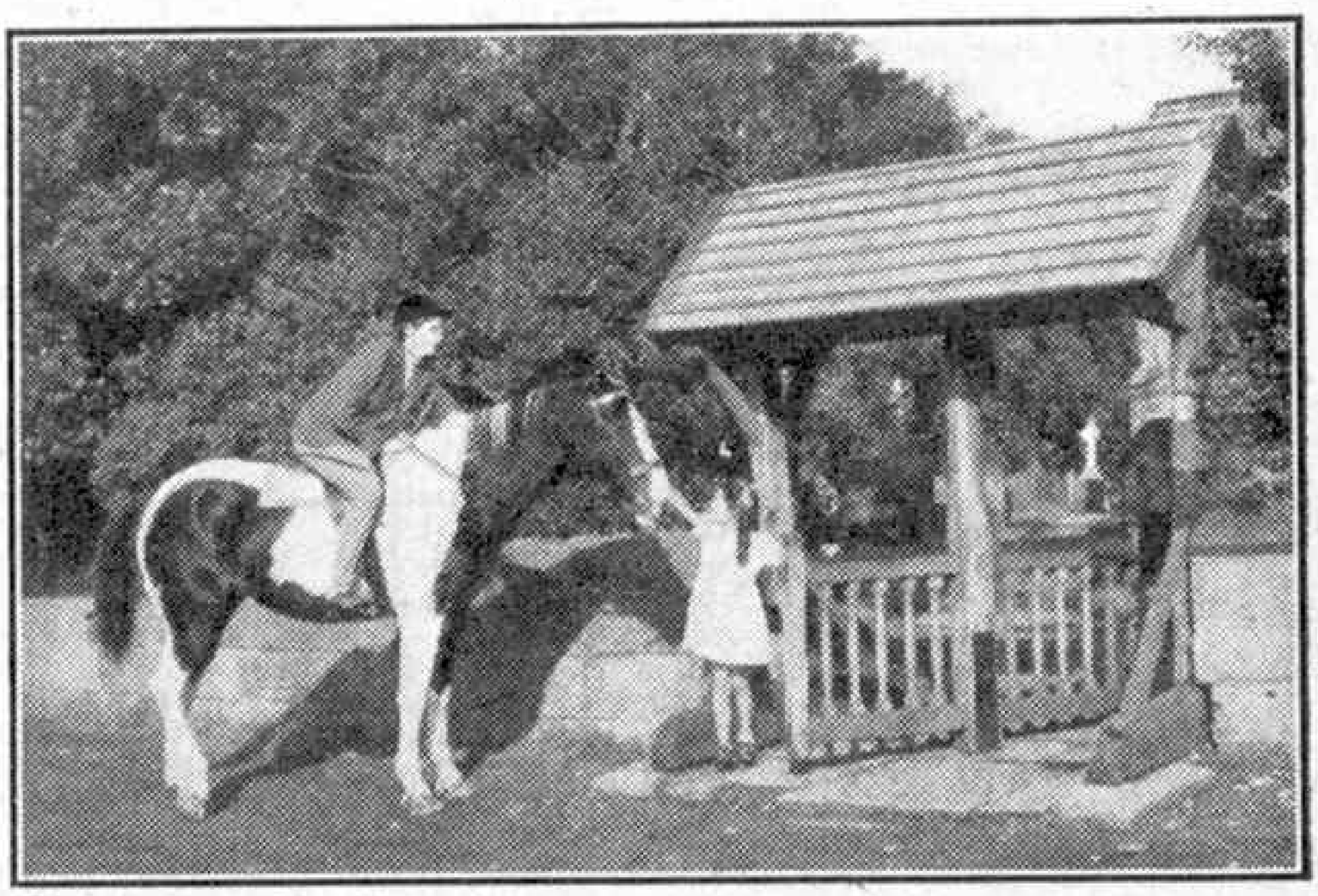
MAY 1951 PHOTOGRAPHIC CONTEST

1st Prize, Section A: Miss I. Stephenson, Orakei, N.Z.; Section B: K. N. Murray, Jinja, B.E.A. 2nd Prize, Section A: Miss A. F. Neilson, Pleasant Point, N.Z.; Section B: P. Jones, Kandy, Ceylon. 3rd Prize, Section A: F. Mulvagh, Sligo, Irish Republic. Section B: R. Burke, Pennsylvania, U.S.A. Consolation Prizes: D. McLellan, Inglewood, N.Z.; S. J. Twycross, Causeway, S. Rhodesia; N. Benary, Melbourne, Australia; J. Young, Rosslare, Irish Republic.

SOLUTION

FEBRUARY 1951 RAILWAY QUIZ

1. (*a*) Richmond line (S.R.); former L.M.S., S.R. and L.P.T.B. (*b*) Wirral line (L.M.R.); former L.M.S. and Mersey Railway. (*c*) Watford Electric line (L.M.R.); former L.M.S. and L.P.T.B. (*d*) Southport electric line (L.M.R.); former L.M.S. and Liverpool Overhead Railway, at Seaforth.
2. Liverpool to Southport line (L.M.R.) and Tyneside Electric (N.E.R.) lines.
3. Manchester to Bury service.
4. No. 13 (B.R. No. 26999), 4–6–4, designed by Sir Vincent Raven for the North Eastern Railway.
5. The Central London Railway, now part of the Central Line of London Transport.
6. Liverpool Overhead Railway.
7. No. 6000, ex-L.N.E.R., which has been working in Holland.
8. Grimsby to Immingham line, E.R.
9. "Brighton Belle," runs between London (Victoria) and Brighton.
10. Glasgow Subway or Underground.



"At the Lych Gate." A pleasant study of horse and rider by J. R. Hill, Liverpool 13, that was awarded 3rd Prize in the December Photographic Contest last year.

A Great New Steel Works—

(*Continued from page 541*)

tinplate. Trostre is near Llanelly, and there a new tinplate works has been established as part of the general scheme for modernising the industry.

The electrical installations of the Abbey and Margam Works are on an enormous scale. Equipment worth about £10,000,000 has been installed and the annual consumption of electricity will be approximately the same as that of a city of the size of Cardiff. The National Grid will provide three-quarters of the demand, and the Company's power station at Margam Works will supply the rest. This power is transmitted to the Works through 66,000V overhead lines and is transformed at sub-stations to 11,000V for primary distribution, while in addition there are a secondary distribution at 3,300V and a low tension distribution of 415V, the latter for motors below 100 h.p. and for general works lighting.

The whole of the electrical equipment is of British manufacture. A total of about 175,000 h.p. of plant is installed, including some 6,000 motors, and there are more than 500 miles of main cable laid underground with many thousands of miles of control and other types of cable.

The World's Greatest Air Show—

(*Continued from page 550*)

and a glimpse of the future in the shape of the Boulton Paul P.111 and Avro 707 deltas, the latter handling just like any other aeroplane under the master touch of Roly Falk.

But for sheer spine-tingling thrills nothing could match the flying of Jan Zurakowski in the P.V. "Meteor," loaded with 24 rockets and wing-tip fuel tanks. After beating up the airfield, he set the aircraft's nose up in a vertical climb, higher and higher, until even the "Meteor" could climb no further and it began to topple over in a stall. At that precise moment, "Zura" shut down one engine and opened the other to full power, so that the "Meteor" did two vertical cartwheels before dropping off into a horrifying spin, from which it quickly recovered.

Some say this was the first new aerobatic invented for 20 years. Whether it was or not, it left no doubt of the sturdiness of the "Meteor," mainstay of our island defences until the "Venom" and the new Hawker P.1067 and Supermarine "Swift" are in service.

The show is now over, the pilots and 'planes dispersed to a score of airfields throughout these islands. But the thrills of "Farnborough 1951" and the certainty of British leadership in the skies will never be forgotten as long as aviation people still gather together and talk shop.

The "Octopus" in Meccano—

(*Continued from page 557*)

board, and alight from the cars it is necessary to ensure that each car is at its lowest position when directly over the platform, which is arranged by locking the off-set when it faces directly toward the control platform. To do this the off-set gearing must be disengaged and also locked to prevent it turning by frictional grip.

In the model both these operations are performed automatically by the control 25 (Fig. 5). When it is desired to lock the off-set the control 25 is pressed downward and held in position by turning it so that the Fishplate is caught under the head of the ¾" Bolt adjacent to it. The movement of the control 25 is then transferred to the Rod 26, which is extended and joined to a Threaded Rod 27 (Fig. 6), journalled in Collars bolted to the underside of the base. This Rod is fitted with two Collars 28 and 29 fixed in the positions shown. When the control 25 is pressed the Collars are pushed along, and as they come into contact with the projecting ends of Rods 30 and 31 their rounded surfaces force the Rods upward. When Rod 30 is moved upward the ½" Pinion fastened to it is disengaged from the 1½" Gear on Rod 24, and when Rod 31 is moved upward the Fishplate 32 engages with the teeth of the Gear on Rod 24, so preventing the off-set from turning. The Fishplate 32 is bolted to one side of a small Fork Piece. The Motor is switched on and off by the lever 33 (Fig. 5).

Easy Tricks for the Christmas Party—

(*Continued from page 538*)

through the cloth and so draw out the blind, revealing the Christmas card. (Fig. 10).

A TRICK WITH MATCHBOXES

You show a number of matchboxes, three or four. All are empty except one, which is half full of matches.

"These look like quite ordinary matchboxes" you remark, "but actually they are excessively special. They can be empty or half full of matches just as you please." You lay the boxes on the table and ask a member of the audience to point to one. "Would you like it full or empty?" you ask. Whichever is the reply, you take up the chosen box and show that it is full or empty, exactly as the spectator asked.

How it is done. In describing the working of this trick I am going to use the frightfully technical sounding word "palming." But don't let it frighten you. All it means in this instance is holding a matchbox in the curve of your fingers so that its presence is not noticed. (Fig. 11, page 538).

You will need three empty matchboxes, all alike, and a fourth containing some matches. At the start you have one empty box palmed and you show the others, two empty and one containing matches. If you like you can have more boxes, it makes no difference to the working of the trick. Show that all the boxes but one are empty. Now in turning to lay the boxes on the table you palm the full box and lay out only the empty ones.

You are now in a position to show that any box is either full or empty, as required. If the audience say "empty," then it doesn't matter what box is chosen because they are all empty. You pick it up, with your left hand, shake it, open it, show it empty and drop it on the table again.

If "full" is called for, you pick up the chosen box with your right hand, in which the full box is palmed. Shake the visible box and the matches in the palmed box will rattle. Now place the visible box in your left hand, then secretly slide the palmed box on top and open that. Your left hand conceals the empty box. Now re-palm the full box as you take the empty box from your left hand. Throw the empty box on the table and carry on with the trick.

At the end of the trick, gather up the boxes, exchanging the full box for an empty one and you can hand out all the boxes (except the palmed one of course) for examination.

A TRICK TO FINISH WITH

This is a nice showy trick to wind up the show. You take a folded cloth from your assistant and spread it out between you. Then from the cloth you produce a large basket of flowers.

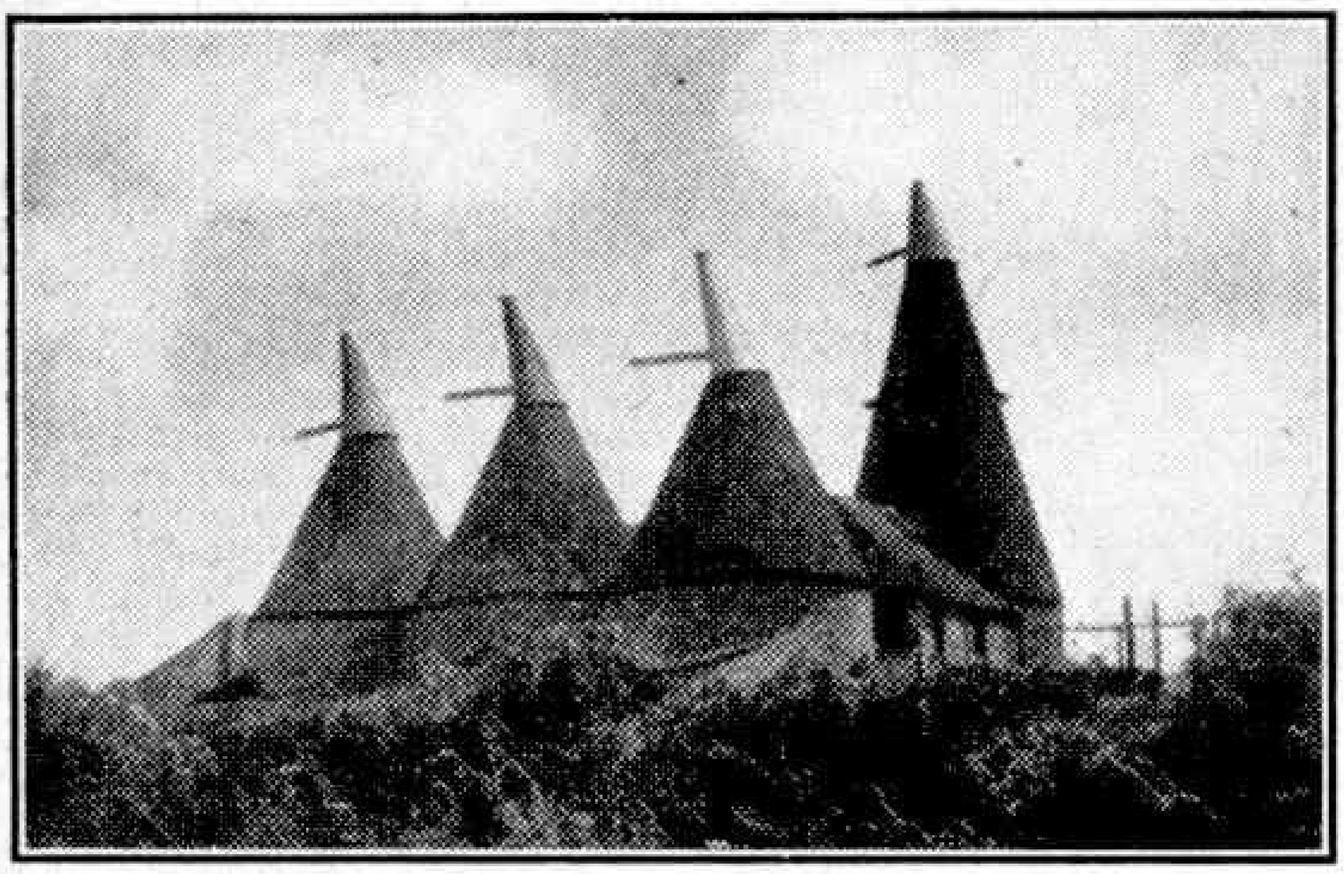
How it is done. Your assistant attaches the basket to his back by means of a little sharp hook fixed to the top of the basket. The basket must not be so large as to be visible when he faces the audience. He hands you a large folded cloth. You open this, show both sides, crumple it and toss it into the air to convince everyone there is nothing concealed in it. Now you spread it four-square to the audience and move up to the left side of your assistant. He takes the corner nearest him with his right hand. As he does this he puts his left hand behind him, unhooks the basket and holds it behind the cloth. You are holding the opposite corner of the cloth with your left hand. Now hold up your right hand to show it empty, then bring it down behind the cloth, take the basket from your assistant and walk forward, letting the cloth drape over the basket. Your assistant lets go of the cloth and steps to one side, and you produce the basket with a flourish.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

THE CASTLES OF KENT

Among the best known sights of the Kentish countryside are the red tiled roofs of the famous round hop kilns, the feature by which the county is singled out from the rest of England. So like the turretted tops of a medieval fortress are these buildings that they have become known as the "Castles of Kent." They are the centre of the famous hop industry. Strangers often mistakenly call them oasts, but actually this name applies to the whole building, comprising the receiving barn, the drying shed and the kilns themselves.



The "Castles of Kent" are the kilns in which hops are dried. This photograph of a group of kilns is by P. Baker, Dover.

The kilns are built simply to house a fire for the drying of the crop, and it is not surprising that their dominating feature is the chimney. The lower section of this structure, sometimes square and sometimes round, is about 16 ft. in height and has an anthracite fire burning in a brick fireplace. Above this there is an open batten floor spread with a loosely woven horsehair cloth on which the hops are strewn as they come in from the gardens. There they are dried by the passage of the hot air through the slats and weave of the cloth. This then passes through the cone-shaped top, which extends another 18–24 ft. upward, and is finally wafted through a large opening and carried away by the wind over the surrounding countryside. This opening is surmounted by a large white wooden cowl on a pivot, which ensures that it always faces away from the wind.

P. Baker (Dover).

AN ABANDONED RAILWAY LINE

It has been announced that a company is to work the Lowther Hills, in southern Scotland, for lead and zinc. This news recalls that the district around Leadhills, in Lanarkshire, and Wanlockhead, in Dumfriesshire, has a history of metal mining dating from Roman times.

The Lowther Hills consist of a lofty series of green mountains, separated by deep valleys, in the area lying between the Carlisle-Glasgow railway line by Beattock and the former Glasgow and South Western route by Dumfries and Kilmarnock. The hills reach their highest point at Green Lowther, 2,403 ft., while Leadhills and Wanlockhead, around which prospecting is to go on, are 1,350 ft. and 1,380 ft. high respectively.

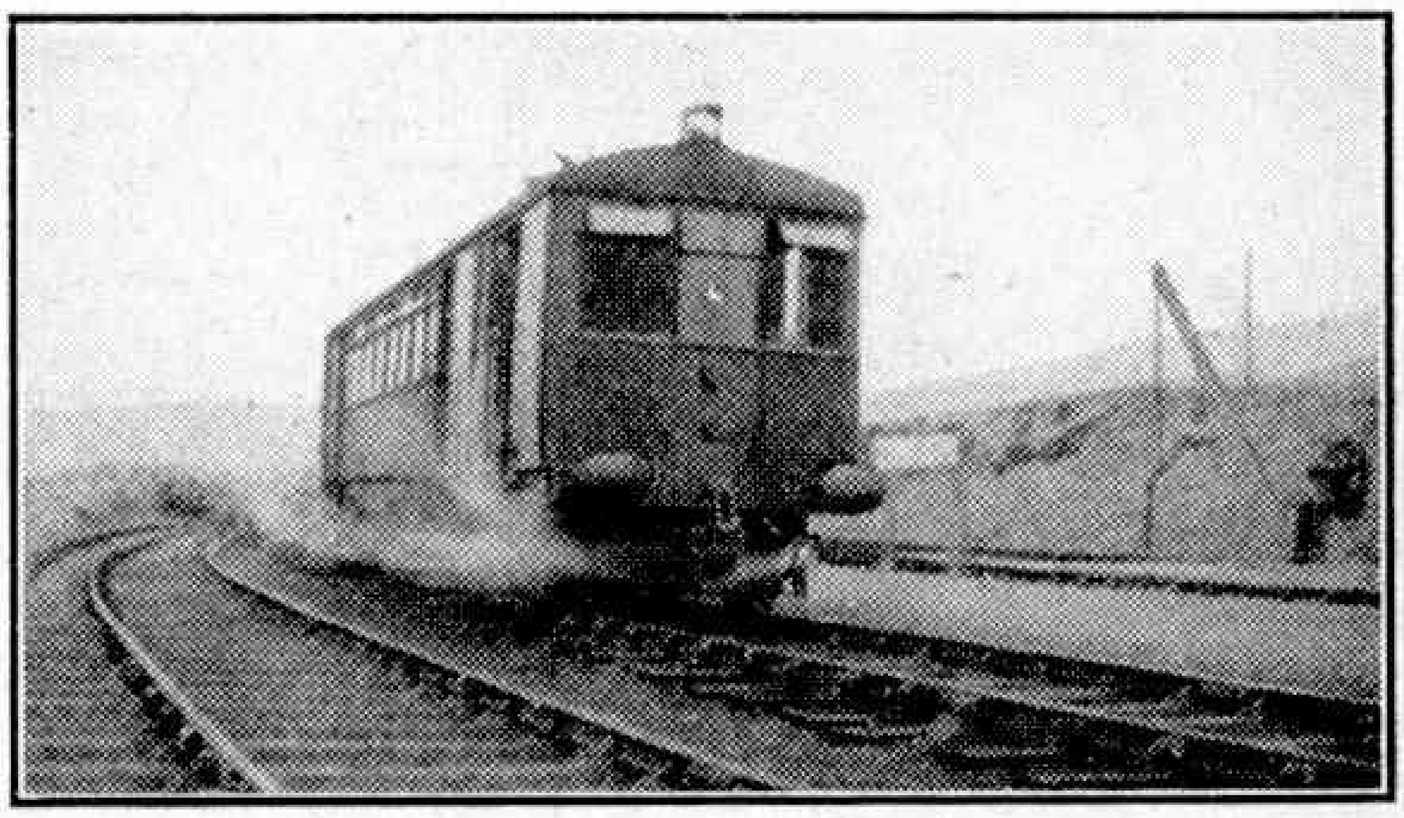
Wanlockhead, although in "the Lowlands," is the highest village in Scotland. Youth hostellers know it for Lotus Lodge, formerly the home of a mine manager and of a doctor, which was opened by the Scottish Youth Hostels Association nearly 20 years ago.

Since the Middle Ages the area has been known as "God's Treasure House in Scotland" on account of the mineral wealth that has been extracted from the hills. The crowns of the King and Queen of Scotland are said to have been made from gold found in the Lowther Hills, and an Elizabethan adventurer secured gold worth £100,000 there in three years. Records of lead mining date back as far as the 13th century and until fairly recently mining was still carried on. Silver has been worked at a profit in Wanlockhead, while along with lead ore copper pyrites, sulphuret of zinc and barytes have been found.

Until the 1939–45 war there was a branch line 5¾ miles long from Elvanfoot, on the Carlisle-Glasgow line by Beattock, up the wide and lonely glen of Elvan Water to Leadhills and Wanlockhead. This reached an altitude of over 1,400 ft. and was the third highest standard gauge line in Britain. The line was dismantled, however, and now Leadhills and Wanlockhead maintain contact with the outside world by means of a regular bus service from Abington to Sanquhar.

The course of the line can still be traced quite easily. The cuttings and embankments form a prominent feature of the local landscape, and indeed are a popular promenade for the people of Leadhills and Wanlockhead.

M. B. C. (Letchworth).



A steam passenger coach on the line from Elvanfoot to Wanlockhead, shortly before the line was closed. Photograph by M. B. C., Letchworth.

Fireside Fun

"Aren't these bees a nuisance, buzzing all round the sugar?"

"Rather. It's funny how such busy things always find time to go to picnics."

* * * *

"I hope you're sharing the sledge with Susan."
"Sure, Mr. Jones. She has it uphill; I have it down."

* * * *

"I see Jones has started some electrical experiments. Has he got any results?"

"Oh, yes, shocking ones."

* * * *

"What on earth do you mean, knocking me up at two in the morning. This hotel's closed and I am not coming down to open it."

"But I want to stay here."

"All right. You'll find the doorstep a bit hard, so I'll drop you a cushion out of the window."

* * * *

"Hi, waiter! This water is awful. Just look at the dirt in it."

"But the water is quite clean, sir. Hold it up to the light and you'll see its the glass that's dirty."

* * * *

"The thieves who broke into old Jones' shop were properly taken in, weren't they?"

"I don't know. How?"

"Well, the old boy had just marked everything down for his sale, so they didn't get as much as they would have done the day before."

* * * *

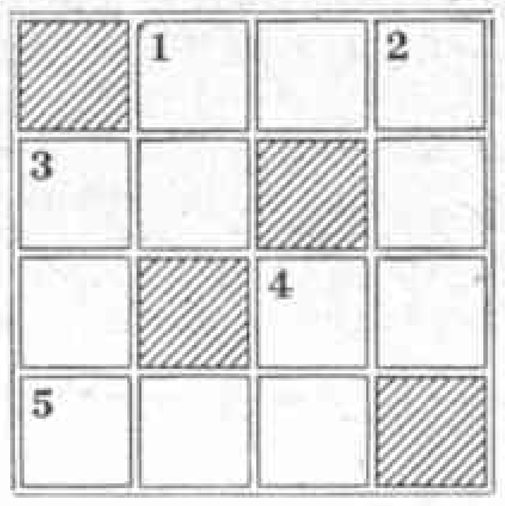
"Mum! There's a big black cat in the kitchen."
"That's all right Jimmy. Black cats are lucky."
"This one is—he's got the turkey!"

BRAIN TEASERS
THROW LIGHT ON THIS

A boy had only one match, and had to light both the gas cooker and the fire. If he were a smart reader of Brain Teasers which would he light first?

* * * *

AN INTERESTING NOVELTY



Here is a neat and interesting puzzle that could perhaps best be called a cross number. From the clues given find the numbers required to fill the vacant squares in the accompanying diagram.

Clues across: 1, see 5 across and 2 down; 3, 4 by 4 across; 4, a power of 2; 5, one third of 1 across.

Clues down: 1, the same as 3 across; 2, two-thirds of 1 across; 3, 4 down by 34; 4, last two digits of 5 across. G.C.

* * * *

DON'T CUT THE EGGS IN HALVES!

A poultry farmer has three customers for his eggs, but only a limited number of these to sell. Half of these plus half an egg went to the first customer; half of what he had left plus half an egg to his second customer; and half the remainder plus half an egg to his third customer. How many eggs did he start with? R.H.

* * * *

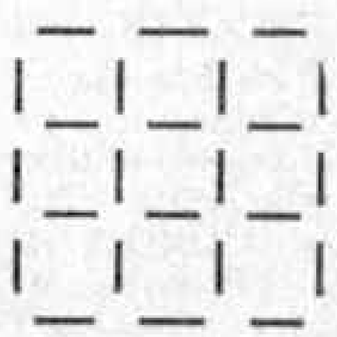
"My Mummy talks to herself."
"So does mine, but she doesn't know it. She thinks I'm listening."

* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

The accompanying diagram shows how to make the 14 squares of our first puzzle last month.

In our second puzzle call the two ropes A and B. Tie their lower ends together. Then climb A and cut off B, leaving just enough of this to tie a loop. Hang by one arm from the loop, cut off A as high as possible and pull the end of this through the loop until the knot reaches it. Then slide down the *double* rope, and on reaching the ground the entire rope can then be pulled through the loop. This is clearly a trick that is possible only for a skilled acrobat, and I need scarcely add that no reader should try it!



"Twice four, and twenty rabbits" make up 28, and those that remain number four. The rest of course ran away.

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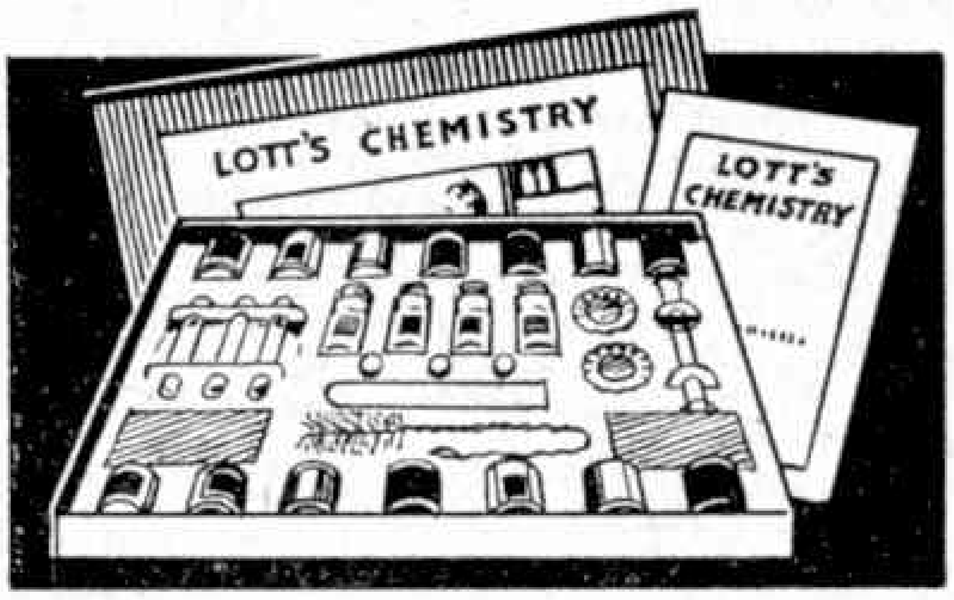

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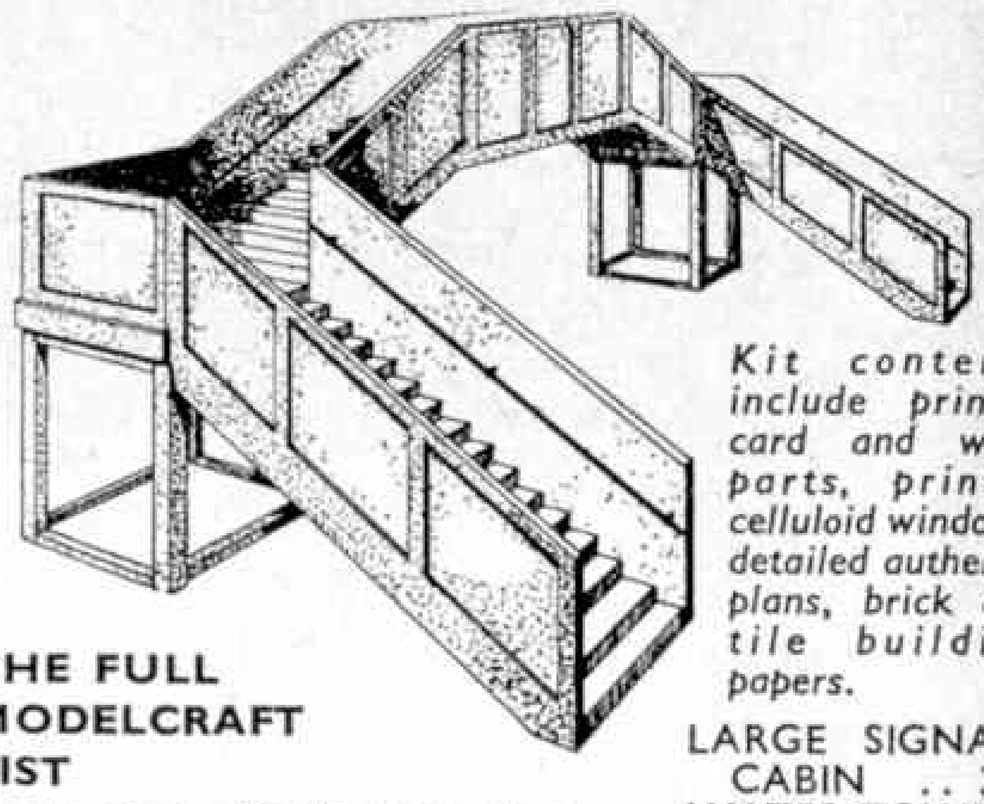

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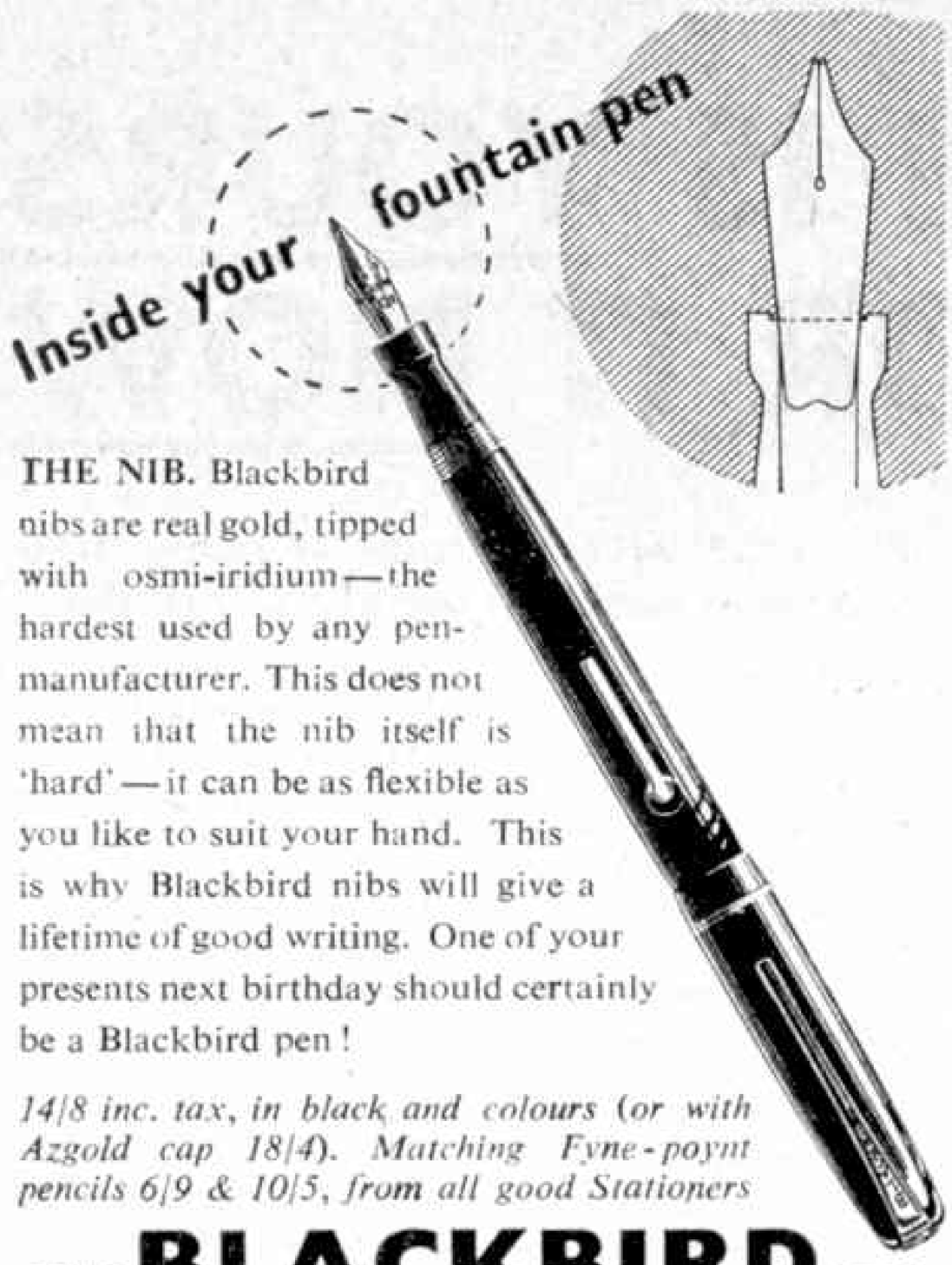

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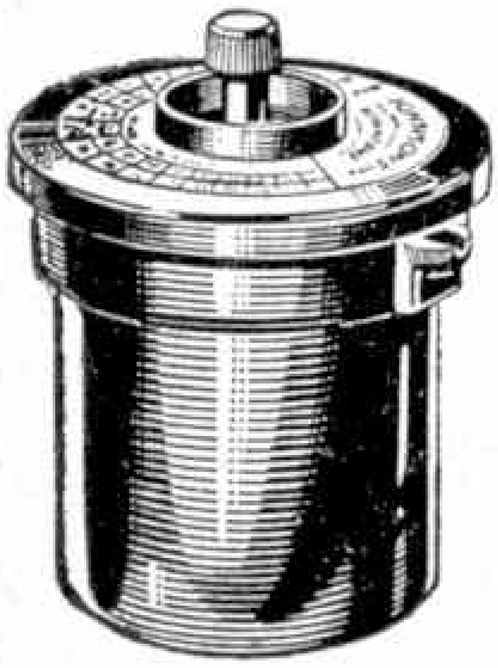

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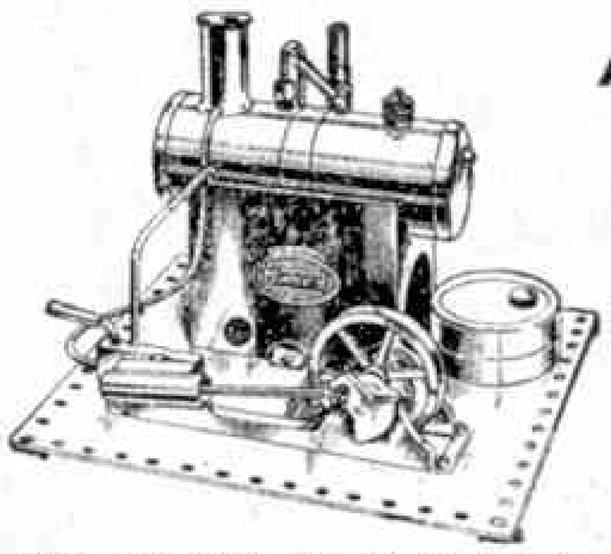

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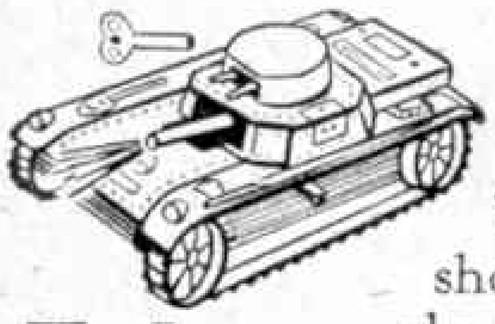

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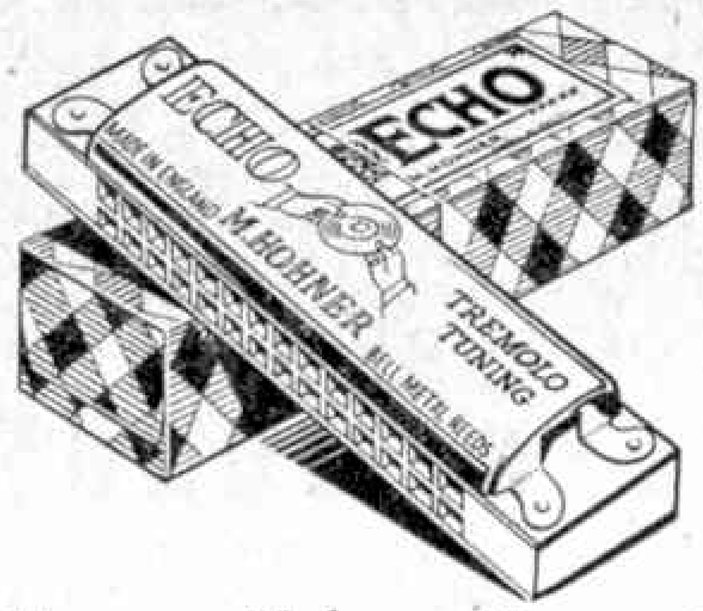

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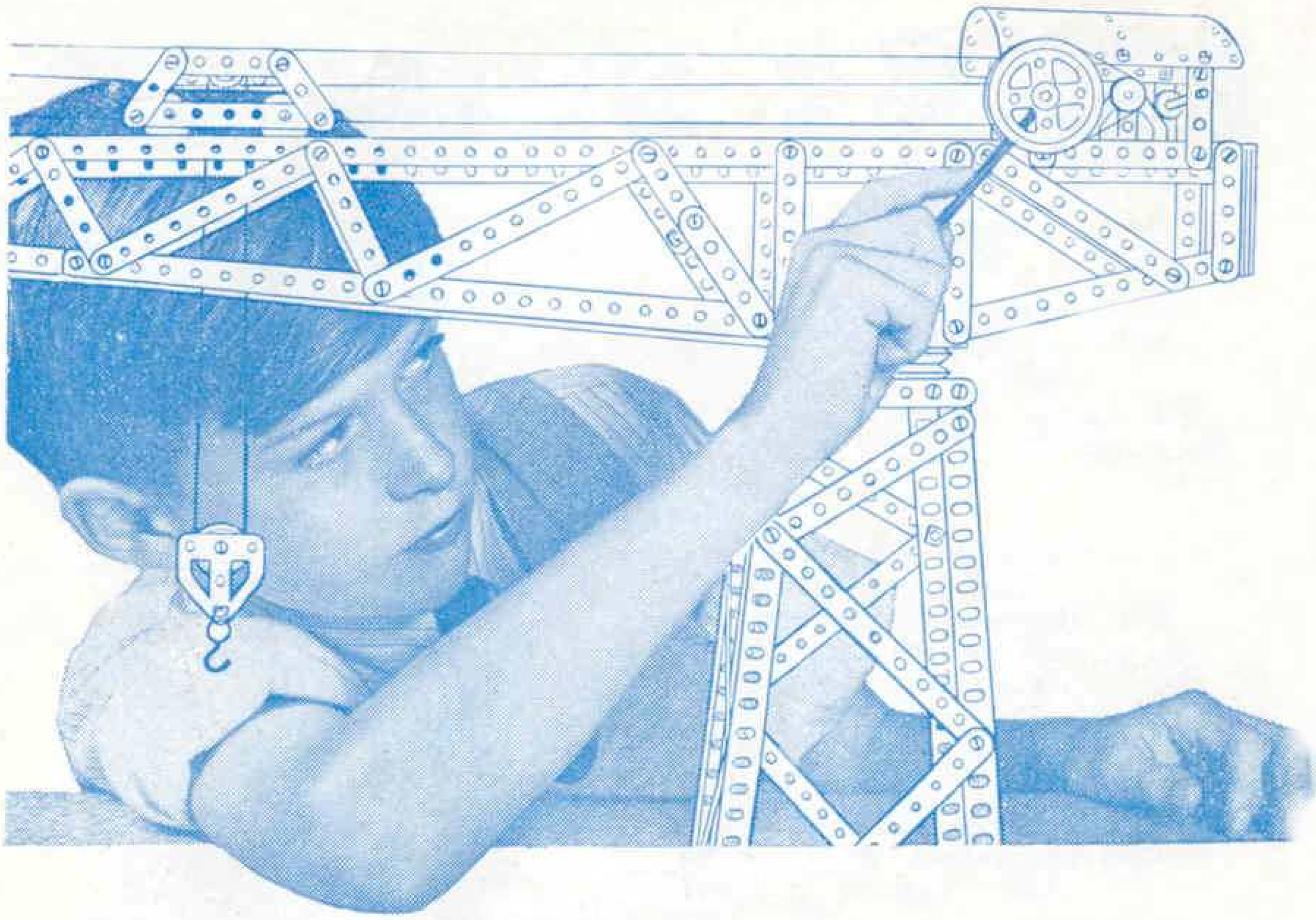

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